

DOCUMENT RESUME

ED 189 095

SP 016 402

AUTHOR Carnahan, Richard Stanley
TITLE The Effects of Teacher Planning on Classroom Processes. Technical Report No. 541.
INSTITUTION Wisconsin Univ., Madison. Research and Development Center for Individualized Schooling.
SPONS AGENCY National Inst. of Education (DHEW), Washington, D.C.
PUB DATE May 80
GRANT OB-NIE-G-80-0117
NOTE 646p.

EDRS PRICE MF03/PC26 Plus Postage.
DESCRIPTORS *Academic Achievement: Classroom Environment: *Classroom Techniques: Educational Strategies: Elementary Education: Grade 5: *Lesson Plans: Mathematics: Motivation Techniques: Student Attitudes: *Student Motivation: *Teacher Behavior: *Teacher Effectiveness

ABSTRACT

The two-fold purpose of this study was to determine the effect of providing teachers with background information about student aptitude and motivation on the quality of teacher planning, and the effect of that planning on student achievement. Nine fifth-grade mathematics classes were observed. Three teachers were given student aptitude information and information on motivation strategies used with the students. Three other teachers were given only student aptitude information. The third group was given no information. Classroom observation assessed teacher clarity, motivation strategy, and student engagement. Results indicated that previous information did not affect the quality of teacher planning. Planning was not related to motivation strategy or student perceived teacher clarity. Student engaged time appeared to be related to teacher clarity. A detailed report on this research project is appended to this document. (JD)

* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *

ED189095



Technical Report No. 541

The Effects of Teacher Planning on Classroom Processes

by Richard Stanley Carnahan, Jr.

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY.

May 1980

Wisconsin Research and Development
Center for Individualized Schooling

Technical Report No. 541

THE EFFECTS OF TEACHER PLANNING ON CLASSROOM PROCESSES

by

Richard S. Carnahan, Jr.

Report from the Project on
Studies in Mathematics

Thomas A. Romberg and Thomas P. Carpenter
Faculty Associates

Wisconsin Research and Development Center
for Individualized Schooling
The University of Wisconsin
Madison, Wisconsin

May 1980

This Technical Report is a doctoral dissertation reporting research supported by the Wisconsin Research and Development Center for Individualized Schooling. Since it has been approved by a University Examining Committee, it has not been reviewed by the Center. It is published by the Center as a record of some of the Center's activities and as a service to the student. The bound original is in the University of Wisconsin Memorial Library.

The project presented or reported herein was performed pursuant to a grant from the National Institute of Education, Department of Health, Education, and Welfare. However, the opinions expressed herein do not necessarily reflect the position or policy of the National Institute of Education, and no official endorsement by the National Institute of Education should be inferred.

Center Grant No. OB-NIE-G-80-0117

MISSION STATEMENT

The mission of the Wisconsin Research and Development Center is to improve the quality of education by addressing the full range of issues and problems related to individualized schooling. Teaching, learning, and the problems of individualization are given concurrent attention in the Center's efforts to discover processes and develop strategies and materials for use in the schools. The Center pursues its mission by

- conducting and synthesizing research to clarify the processes of school-age children's learning and development
- conducting and synthesizing research to clarify effective approaches to teaching students basic skills and concepts
- developing and demonstrating improved instructional strategies, processes, and materials for students, teachers, and school administrators
- providing assistance to educators which helps transfer the outcomes of research and development to improved practice in local schools and teacher education institutions

The Wisconsin Research and Development Center is supported with funds from the National Institute of Education and the University of Wisconsin.

WISCONSIN RESEARCH AND DEVELOPMENT
CENTER FOR INDIVIDUALIZED SCHOOLING

Table of Contents

	<u>Page</u>
Abstract	11
List of Tables	x
List of Figures.	xii
<u>Chapter</u>	
1 Introduction	1
2 Review of Relevant Literature.	9
Introduction to Teacher Planning Model.	9
A Review of Teacher Planning.	12
Student Background Information.	40
Teacher Clarity of Presentation	45
3 Method	51
Sample.	51
Materials	53
Preinstructional Measures	53
Outcome Measures.	56
Observation System.	58
Curriculum Materials.	59
Procedure	60
Experimental Treatments	60
Teacher Training Sessions	63
Observer Training and Observation Procedure	65
Generalizability of Observation	70
Student Pretesting.	73
Information Session	74
Student Posttesting.	74
Summary	75
4 Results.	77
5 Discussion	103
Summary of Findings	127
Limitations and Conclusions	132
References	141

Table of Contents (continued)

	<u>Page</u>
Appendices	151
Appendix A. Revised Model of Instruction- Variable and Relationship Definitions	152
Appendix B. Teacher Planning Model- Variable Definitions and Scaling Procedures	172
Appendix C. Observers Manual- Observer Agreement Tables- Observer Teacher/Pupil Behavior- Frequency Tables-Mean Percentages of Classroom Behavior.	181
Appendix D. Training of Lesson Plan Raters- Generalizability of Raters- Sample Planning Statements- Rater Agreement Tables- Planning Category Frequency Tables- Means Percentages of Planning Categories- Written Lesson Plans.	279
Appendix E. Preinstructional Student Measures- Means and Standard Deviations for Preinstructional Measures	376
Appendix F. Student Outcome Measures- Means and Standard Deviations for Student Outcome Measures.	437
Appendix G. Instructional Materials (Teacher Guide, Student Guide, Student Booklet)- Motivation Information.	454
Appendix H. Teacher Interview Questions- Teacher Interviews-Class Descriptions	581
Appendix I. Median Split Procedure for Selecting Students for Observation.	638
Appendix J. Supplementary Analyses and Tables.	643

Appendices are not included in this volume. They are available upon request from (ERIC), 4833 Rugby Avenue, Suite 303, Bethesda, Maryland 20014.

List of Tables

<u>Table</u>	<u>Page</u>
1 Teacher Experience, Mathematics Class Size, Treatment Group and Observer Assignments for Participating Teachers	52
2 Generalizability Coefficients (ρ) for Each Classroom Behavior for Each Observer	72
3 Means and Standard Deviations for Planning Scores in Each of Three Treatments	78
4 Summary of Analysis of Variance for Teacher Planning (Raw Scores).	83
5 Planned, Pairwise Comparisons Among Treatment Groups for Raw Planning Scores	83
6 Planning and Observed Motivation Strategy Use Scores for Each Teacher by Day	86
7 Observed Teacher Clarity Scores for Each Teacher by Day	90
8 Means and Standard Deviations for Teacher Planning and Perceived Clarity by Class.	92
9 Student Engaged Time Scores for Each Teacher by Day	95
10 Means and Standard Deviations for Student Engaged Time and Student Perceived Clarity by Class	96
11 Pooled Within Zero-Order Correlations Among the Variables Prior Achievement (Competency, Problem Solving), Student Engaged Time and Postachievement.	98
12 Analysis of Covariance for Postachievement with Mathematics Competency and Problem Solving Ability as Covariates.	100

List of Tables (continued)

<u>Table</u>	<u>Page</u>
13 Planned, Pairwise Comparisons Among Three Treatment Groups for Post- achievement (Adjusted for Competency and Problem Solving Ability)	100
14 Observed Instances of the Teacher Verbal Behavior "Emphasizing Im- portant Points" by Teacher	111

List of Figures

<u>Figure</u>	<u>Page</u>
1 Overall Variables and Relationships in the Revised Model of Pedagogy (Romberg, Small & Carnahan, 1979)	3
2 Teacher Planning Model.	11

THE EFFECTS OF TEACHER PLANNING ON
CLASSROOM PROCESSES

Richard Stanley Carnahan, Jr.

Under the supervision of Professor Frank Hoover Farley

The purpose of this study was twofold: First, the effect of student aptitude and motivation strategy information on the quality of teacher written planning in elementary mathematics classes was examined, and second, the relationship of written planning quality to the quality of classroom interactive and organizational environments was also investigated. Quality planning was defined as planning which focused on individuals and small groups rather than on large groups. Quality of the interactive and organizational environments was indexed by observed teacher clarity of presentation and motivation strategy use. Verbal behaviors chosen to represent teacher clarity included outlining objectives, explaining what to do next, relating present content to past or future, reviewing or summarizing, repeating questions or explanations and emphasizing important points. Motivation strategies included games or puzzles, heterogeneous small grouping and inter/intragroup competition.

Hypotheses examined in the study included (a) that teachers given information about student aptitudes and motivation strategies

would evidence higher planning quality than teachers not given such information, (b) that higher planning quality would predict greater observed and student perceived teacher clarity as well as greater motivation strategy use, (c) that greater motivation strategy use would predict greater student engagement, and (d) that greater observed and student perceived teacher clarity would also predict greater student engagement.

To test the above hypotheses, each of nine fifth-grade teachers, with their mathematics classes, was randomly assigned to one of three experimental treatments. In the first treatment group, prior to the beginning of instruction, three teachers were given student aptitude information, in terms of prior mathematics achievement and motivation towards mathematics, in addition to information about motivation strategies mentioned above. In the second treatment group, three other teachers were given only student aptitude information. In the third treatment group, the final three teachers were not given any information. Pre-instructional student measures used to obtain aptitude information included (a) fourth-grade mathematics competency, (b) mathematics problem solving ability (competency and problem solving were combined to form a measure of prior achievement), and (c) attitude toward mathematics; in this case attitude was considered reflective of student motivation. Student outcomes

included measures of (a) perceived teacher clarity, (b) post-instructional attitude toward mathematics and (c) postachievement. All teachers taught the same mathematics content for the duration of the study.

Classroom observation was used to assess (a) teacher clarity (b) motivation strategy use and (c) student engagement. Teacher written planning statements for the instructional period were coded by two independent raters to obtain a measure of planning quality for each teacher, based on statements focusing on individuals or small groups.

Results indicated first, that there was no treatment effect on quality of written planning done. Second, written planning was not related to motivation strategy use or student perceived teacher clarity. And third, student engaged time was not related to motivation strategy use but was related to observed and student perceived teacher clarity. These results were examined in light of previous research.

Finally, limitations, in terms of experimental design, measures, and observational techniques, and conclusions of the study as well as possible future research directions were discussed.

Approved by:

John H. Farley

Date:

April 30, 1980

For my wife, Carol, whom I will love forever

Acknowledgements

It is hard to write acknowledgements when there are so many people who have had something to do with the final product. But I will try anyway.

First, I would like to say how much I appreciate my advisor Dr. Frank Farley. He was what I believe an advisor should be. Dr. Farley helped me through some rough times and he was always there when I needed him. His smiling face and ready wit were always welcome. The conversations we had were always stimulating.

I would also like to thank Dr. Thomas Romberg for serving as the technical advisor for the dissertation as well as allowing me to work for him in the R & D Center, which paid for most of this. Many times when I was fresh out of ideas, he came to the rescue and he seemed never to be out of helpful ideas.

Dr. Ronald Serlin served admirably as a statistical consultant as well as a friend. The work is better because of him. He is truly a teacher.

I very much want to thank the remaining members of my committee, Dr. Philip Lambert, Dr. James Moser and Dr. Penelope Peterson who gave insightful advice at all stages.

Many thanks to Louise Smalley, who typed this and deserves more credit than she realizes. I very much appreciate the times

we were able to talk about important things as well as things not so important.

Special thanks go to the teachers and administrators and children of the Wausau School District who participated. Lois Tulane was a great help and without her the project would not have gotten from the planning to the doing stage.

I am not sure I can adequately thank my parents, whose love instilled in me a sense of purpose and a love of God which has been invaluable to me. Their support is immeasurable.

What can I say about my wife? Without her this would never have been accomplished. She was always there to talk to and she always understood. It was a very rough three years, but together we made it. She is a beautiful human being and one whom I am very proud to love and be married to.

Last of all, I want to thank my God and Lord. Without His guidance and patience, this certainly could never have been done. To Him be the glory!

Chapter 1

Introduction

A great deal of effort has been expended in the past two decades in order to identify teacher classroom behaviors and understand their presumed effects on student outcomes. The majority of teacher effectiveness investigations have been concerned with student achievement as a measure of the effectiveness of specific teacher classroom behaviors.¹ Reviews of teacher effectiveness studies have indicated that the assumed direct relationship between teacher classroom behaviors and student achievement is tenuous at best (Dunkin & Biddle, 1974; Medley, 1977).

Recent work (Fisher, Berliner, Filby, Marliave, Cahen, Dishaw & Moore, 1978; Porter, Schmidt, Floden & Freeman, 1978) has begun to examine the notion that certain variables may mediate the influence of teacher classroom behavior on student outcomes. The concept of student "engaged time" is thought to be one of those mediating variables. Briefly, teacher classroom behaviors are hypothesized to predict the amount of class time students are actually working (engaged) on the subject matter. Researchers then suggest that student engaged time is predictive of student

¹Affective student outcomes (for example, pupil self-concept) have also been used, but to a lesser degree (Kash & Borich, 1978).

achievement. Results of studies conducted at Far West Laboratories (Fisher et al., 1978) and the University of Wisconsin (Small, Carnahan & Romberg, 1980 a,b), which have used engaged time to predict achievement, are encouraging.

Romberg, Small and Carnahan (1979) have proposed a classroom instructional model that describes elements expected to be important in classroom instruction. The model depicted in Figure 1 suggests that student engaged time is a function of several aspects of instruction, including the organizational and interactive environments of the classroom as well as the amount of time actually allocated for instruction. In turn, organizational and interactive environments, and the time allocated for instruction are all influenced by other variables: teacher planning, student and teacher characteristics, and the subject content being taught. Definitions of model categories and relationships can be found in Appendix A.

Certain elements of this model, such as content structure and parts of both the organizational and interactive environments are being investigated (Small, Carnahan & Romberg, 1980 a,b) and results obtained will enable us to better understand the relationships proposed and possible relationships not expected. One element thought to be particularly important and which is the focus of this study is teacher preinstructional written planning.

If one holds to the notion that teachers influence what happens in the classroom, then one conclusion would seem to be how teachers

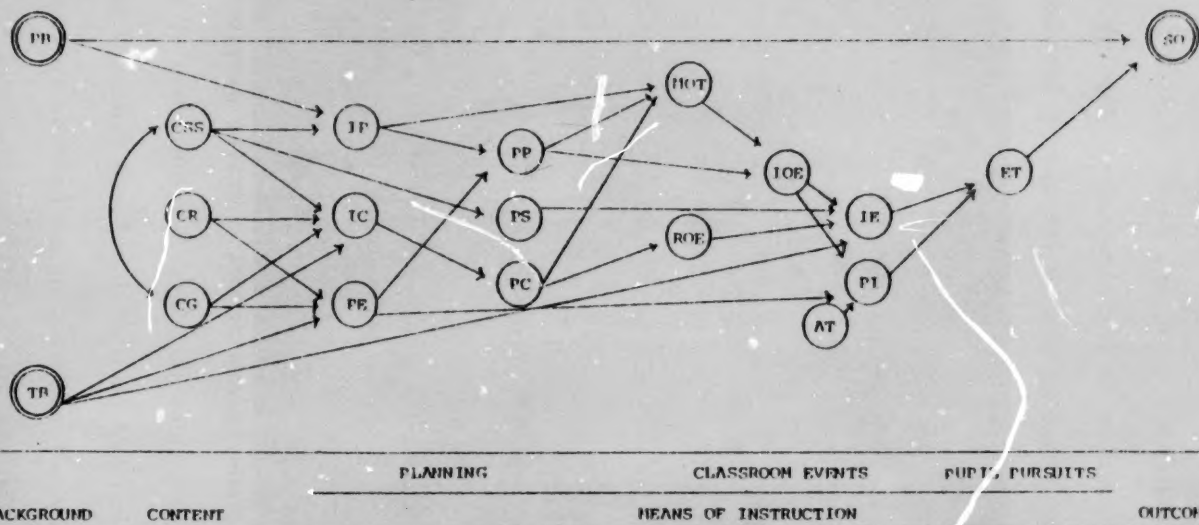


Figure 1: Overall variables and relationships in the revised model of pedagogy (Romberg, Small & Carnahan, 1979).

plan to organize the classroom environment and teach the lesson would also influence classroom events. Classroom research is concerned with student outcomes; that is, does the student change in any measurable way by being in the classroom. Zahorik (1970) suggests careful teacher planning may be one way of helping insure student gains occur. Morine (1976) proposes that the belief that planning is important pervades American society, and so it is no wonder education views planning as vital.

Studies have examined teacher planning in several ways. Attempts have been made to understand what information influences planning (Morine, 1976), what teacher planning looks like (Morine, 1976; Peterson, Marx & Clark, 1978; Yinger, 1978; Zahorik, 1975), what teachers believe about planning (McCutcheon, 1979), and the effects of planning on the classroom environment (Peterson, Marx & Clark, 1978; Zahorik, 1970).

Previous research has identified several types of student background information which seem to influence written planning: prior achievement, student motivation towards subject matter, curiosity, sex, attitude toward school. Unlike previous work, however, this study attempts to control which types of student background information are made available to teachers prior to instruction. Clearly not all student background information can

be controlled. Since in this study mathematics is the content focus, it is the investigator's belief that student prior mathematics achievement and student motivation towards mathematics are two pieces of information teachers may find useful when planning. Indeed, teachers have indicated that both kinds of information are important (see Clark & Yinger, 1978). In addition, once students have been identified, the investigator believes information given to teachers indicating possible motivation strategies would also be useful. It must be noted here that this study is concerned with the quality of teacher written planning rather than quantity. In this respect, quality planning is viewed as planning which focuses primarily on individual or small groups of students rather than on large groups. A premise of this study is that such planning would be more effective in facilitating a classroom environment conducive to learning.

The notion that planning seems to influence both the classroom organizational and interactive environments is supported (Morine, 1976; Peterson, Marx & Clark, 1978). What this study is concerned with is the effect of planning quality on the quality of both the organizational and interactive classroom environments. In this investigation, quality of the interactive classroom environment is indexed by teacher clarity of presentation which, although measured

in many ways, has generally been found predictive of student achievement (Dunkin, 1978; Rosenshine, 1968 in Westbury & Bellack, 1971, chapter 9; Wright & Nuthall, 1970). It seems that teacher clarity of presentation while important in any teaching situation, should be especially important when teaching mathematics. In general, the sequential nature of mathematics instruction presumes students have understood prior concepts and relationships. Such may not be the case in other content areas.

This investigation is also examining the relationship of planning quality to the quality of the organizational environment; quality in terms of the use of motivation strategies thought useful in dealing with certain types of students identified previously. The use of certain motivation strategies has also been found to be positively related to student achievement (see, for example, Johnson, Johnson, Johnson & Anderson, 1976).

As indicated earlier, recent work has shown a positive relationship between student engaged time and student achievement. Naturally, one most likely should be interested in those aspects of the classroom environment which seem to affect engaged time. This study, then, also attempts to examine the relationship of the quality of the interactive and organizational environments with student engaged time.

Overall, the problem with which this study is concerned then is sequential in nature. First, how does student background information and motivation strategy information influence the quality of teacher written planning. Second, does quality of written planning influence quality of organizational and interactive classroom environments. And third, does quality of organizational and interactive classroom environments influence student outcomes. It should be noted that the above sequence is not, however, a logical but a temporal one. As such, analyses for each part of the sequence can legitimately be carried out independently of the results for any other part. Specifically, primary questions to be examined in this investigation are:

1. How does aptitude information about individual students given to teachers affect the quality of preinstructional planning done by teachers?
2. Do teachers who are given information about motivation strategies to use with individual or small groups of students plan differently (in terms of quality) than teachers not given such information?
3. Is quality of preinstructional planning related to the use of motivation strategies in the classroom?
4. How is quality of teacher preinstructional planning related to observed and student perceived teacher clarity of presentation?

5. Is motivation strategy use in the classroom related to student engaged time?

6. How is teacher clarity of presentation related to student engaged time?

To answer the above questions, nine fifth-grade mathematics classes participated in a two-week instructional period in which the same mathematics content was taught by all participating teachers. Live classroom observation was used to measure classroom events and teacher written lesson plans for the entire instructional period were collected.

The remaining chapters of this paper deal with the following:

- (a) a review of relevant literature and statement of hypotheses,
- (b) a detailed description of the experimental methodology used in examining the questions, (c) results of the investigation related to the original questions asked and (d) a discussion of results for both primary and secondary questions.

Chapter 2

Review of Relevant Literature

Introduction to Teacher Planning Model

This study is primarily concerned with teacher written pre-instructional planning and its effects on the classroom organizational and interactive environments. Research suggests written planning is first influenced by student background information teachers have available and second, influences both the classroom organizational and interactive environments. In this study two types of student background information were made available to teachers: student prior mathematics achievement and student motivation toward mathematics. In addition, information about motivation strategies which might be used in the classroom was also given to some teachers.

As indicated in chapter 1, teacher clarity of presentation, in terms of teacher verbal behaviors believed to represent clear instruction of mathematics, is used to measure the quality of the classroom interactive environment. Quality of the classroom organizational environment is measured by the use of particular motivation strategies. Certainly, other indices of the organizational and interactive environments might have been chosen. However, because of the nature of the content being taught and the

student information given, the two measures described above are used. Student outcomes will be measured in terms of engaged time and student achievement.

The model of teacher planning presented in Figure 2 illustrates possible predictive relationships between the variables to be examined in this study. Briefly, the model first suggests information about student prior achievement, student motivation toward mathematics and information about motivation strategies which might be used all influence the quality of written planning done by the teacher. Quality of written planning, it should be remembered, is viewed in terms of planning done with individuals or small groups rather than large groups in mind. There is evidence which indicates many types of student information are used by teachers when planning (Morine, 1976; Shavelson, Cadwell & Izu, 1977). Second, teacher preinstructional written planning is believed to predict how verbally clear the teacher's presentation is as well as the use of motivation strategies in the classroom. Research findings show that written planning does seem to predict what the teacher says. However, the effect of written planning on verbal behaviors believed representative of teacher clarity is not known. Third, observed teacher verbal clarity and motivation strategy use are hypothesized to predict student engaged

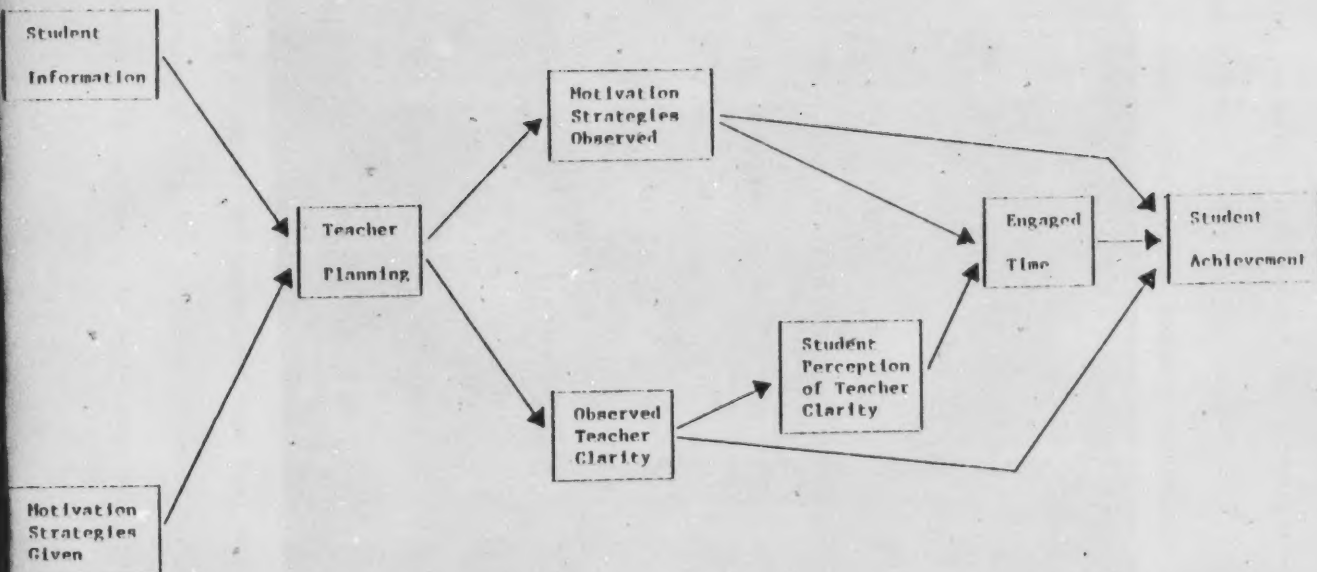


Figure 2: Teacher planning model.

time and student achievement. The positive effects of motivation strategy use on achievement has been shown (Johnson, Johnson, Johnson & Anderson, 1976). Similarly, teacher verbal clarity has been found to be positively related to student achievement (Dunkin, 1978; Rosenshine, 1968 in Westbury & Bellack, 1971, chapter 9). The effects of motivation strategy use and observed teacher clarity on engaged time have not been tested. The effect of observed teacher verbal clarity on engaged time is thought to be mediated by the student's perception of how clear the teacher is. The notion that student perceptions mediate teacher influence is supported (Cronbach & Snow, 1977). Finally, student engaged time is expected to predict student achievement.

In summary, the above model represents a theory of teacher preinstructional planning and its effects on aspects of the classroom environment. As described in Appendix B, each component of the model is unidimensionally scaled. The basic notion behind the model is that variability in one component will produce variability in the components it predicts.

A Review of Teacher Planning

Researchers are just now beginning to focus on the little known area of teacher planning and its relationship to the classroom. Studies have examined types of planning done by teachers,

what things teachers consider when planning and how planning influences what actually occurs in the classroom. Such research is intriguing. For if the classroom teacher has any effect on students' learning, then it is obvious that how the teacher plans to use the time given for instruction, be it 30 minutes, an hour, or a day, is important in understanding the environment which is called a classroom, and how that environment, in turn, influences student outcomes. It should be remembered that in the context of the preinstructional planning model which is the focus of this study, teacher preinstructional planning is thought of as being predictive of both the organizational and interactive classroom environments. It is important to notice that preinstructional planning, which is predictive of the organizational and interactive classroom environments is also thought to be predicted by other elements. In this study, information which the teacher receives about students, as well as motivation strategies given to the teachers to be used in the classroom setting, are both hypothesized to directly influences the kind of planning done by the teacher. Unfortunately, substantive findings with regard to teacher planning and its effects on the classroom environment are scarce. In most cases, we just do not know how teachers do plan, if the majority of them do, let alone

how those plans influence or are predictive of student outcomes. Yet, it will be valuable to examine in some detail the methodologies and results of the investigations that have addressed some of these issues.

Zahorik (1970) studied the question of how teacher planning shapes the actual teaching process. Zahorik's motivation in examining teacher planning was a response to the prevailing notion that if teaching were to be effective, planning had to be a rational process which followed a logical sequence of identifiable procedures. Zahorik believed that such an assumption might very well be unwarranted. To test his hypothesis, Zahorik formulated a specific question: "Is the teacher who plans a lesson less sensitive to pupils in the classroom than the teacher who does not plan?"

Twelve fourth-grade teachers were randomly assigned to two experimental groups, teachers who planned and those who did not plan, with six teachers in each group. Two weeks before the experimental lesson was taught, teachers in the planning group were given a lesson plan which (a) outlined the topic to be taught and (b) also presented several objectives related to the topic. The lesson was to be about credit cards. In contrast, teachers in the no planning

group were only told that in two weeks they should allow one hour for the presentation of a topic which they would be informed of just prior to the actual instructional period. The topic of credit cards was chosen since it was assumed that all teachers were familiar with credit cards and their application, so the material would be teachable even by those teachers who had not planned. All 12 instructional periods were audio recorded for later transcription and coding. A coding instrument was developed and used to measure teacher sensitivity to pupils. Six coding categories were used to determine teacher sensitivity: (a) narrow data initiators, (b) broad data initiators, (c) non-genuine data encouragers, (d) genuine data encouragers, (e) non-authentic data extenders, and (f) authentic data extenders. All categories refer to verbal statements the teacher made during the course of instruction. Data initiators are teacher verbal statements, not in response to pupil statements, which "introduce or permit the introduction of new topics." Data initiators may be either narrow or broad. For example, the statement "Can you add two numbers together?" would be labeled a narrow data initiator, whereas "How do you think we would add two numbers together?" is an example of a broad data initiator. When the teacher comments on the "adequacy, appropriateness, or correctness" of pupil statements, data encouragers are

being used. Genuine data encouragers include statements such as "That's a great idea!" In contrast, a teacher comment like "That's right," or any statement relating neutral or negative feedback is considered a non-genuine data encourager. Data extenders are teacher comments which expand on student verbalizations. Non-authentic data extenders would include a statement of the form "Tom has told us about one type of geometric figure. What's another?" An example of an authentic data extender might be "What else can you tell us about the story?" As might be expected, broad data initiation, genuine data encouragement, and authentic data extension were hypothesized as characteristics of teachers high in pupil sensitivity. At first glance it seems that such categorizations are highly inferential. However, as the above examples show, it seems likely that differentiation of categories was reasonably obtainable. High intrajudge and interjudge reliabilities were reported.

Results suggest some fascinating, although not altogether surprising, conclusions. First, both groups of teachers used more insensitive than sensitive verbal behaviors. Second, teachers who did not plan used significantly more verbal statements indicative of authentic data extension as well as more (not significant) verbal statements indicative of broad data initiation. In contrast,

teachers who planned used significantly more verbal statements representative of non-authentic data extension and more narrow data initiation (not significant). Third, with regard to data encouragement, both groups exhibited similar verbal behaviors. Fourth, it was found that teachers who planned used significantly greater numbers of verbal behaviors which could be classified as data initiation, whereas teachers who did not plan used significantly more verbal behaviors classified as data encouragement.

What do these results tell us? Teachers who plan seem to use more statements which are meant to channel the students' thoughts into a prescribed format as laid out by the teacher. In other words, teachers who planned were less likely than teachers who did not plan to allow students to expand their ideas independently of the teacher's own agenda. Also, teachers who planned seemed bent upon initiating more content areas and less upon encouraging students with regard to students' own ideas.

The conclusions to be drawn are informative. As Zahorik suggests, planning puts the teacher into a logical, sequential teaching framework which is almost "derail-proof." Outcomes decided upon are of utmost importance, and the teacher will try to achieve them at any cost. This finding is important in that it implies the inflexibility of the interactive environment. Once planning

is completed the interactive environment is fixed. As the results show, there is an insensitivity to student needs which becomes apparent during instruction. What the teacher planned to accomplish has highest priority. The fact that teacher's who planned used more narrow data initiators would therefore follow. The lack of difference between groups with regard to data encouragement is seen by Zahorik as possible routinization of such behavior for teachers in either group. That is, encouragement is usually given no matter whether or not teachers plan. It must be stated here that results based on only one experimental lesson are not particularly generalizable and should be considered carefully.

In a follow-up investigation, Zahorik (1975) continued to challenge the rational, "ends-means" model of teacher planning and proposed that the ends become inextricably bound up with the means. Outcomes are defined only in terms of the activities that are planned. This study, then, attempted to identify the types of plans that teachers use and what kinds of decisions teachers make when formulating those plans. One hundred and ninety four teachers (grades K-12 as well as adult education programs; years of experience ranged from 1-20) were asked to list the decisions about instruction they made prior to teaching, in the order in which these decisions were usually made. Eight categories were developed

from the lists to describe the decisions that were made. They were (a) objectives, (b) content, (c) activities, (d) materials, (e) diagnosis, (f) evaluation, (g) instruction, and (h) organization. In addition, teachers who had listed decisions they made prior to instruction which could be classified as either objectives or activities were asked to give examples of typical activities or objectives they had used. Examples of objectives or activities which teachers gave were described as being either specific or general. A specific objective "had a narrow focus, a behavioral form, and was accomplishable in a short time period." A general objective "had a broad focus, a topical form, and could only be accomplished after a considerable period of time." A specific activity is "one designed to achieve a predetermined objective." A general activity "has been designed to have students seek and pursue their own purposes." Data took the form of frequencies for each of the decision categories as well as frequencies for objective and activity types. Analysis of the data was accomplished by comparing order of decisions made, decision categories and objective/activity types by grade level, teaching experience, and teaching subject areas: humanities, science and miscellaneous.

The results are interesting from several viewpoints. First, when teachers were considered as a whole group, activities were

found to be the decision category teachers used most (81%). Such a finding would be predicted by the planning model (see Figure 2) since in the above instance, activities and content were most likely considered one and the same. Second, content decisions were made first the largest number of times (51%). Both findings were consistent when compared with grade level (elementary, secondary, adult) with the one exception that teachers of adult education classes used the decisions category of objectives as frequently as the category of activities (76%). Third, activities were decided upon most frequently in all subject areas except for the miscellaneous group which decided upon the material most often. This is not surprising since miscellaneous subjects included library teaching and remedial reading. Comparable results were obtained when decision order was examined in relation to subject area taught and years of teaching experience; content decisions were made first.

These findings, as Zahorik points out, are not encouraging to either the "separated" ends-means or "integrated" ends-means models of teacher planning; that is, neither objectives nor activities were considered first when planning decisions were made. Content was almost exclusively the first aspect of teaching which teachers based their planning decisions on. It is apparent, then, at least with the teachers sampled, that specific content was very important

in their decisions about what would occur in the classroom. In one sense, it might be said that content itself becomes the focus of classroom instruction. Content or the topic, then, becomes the desired outcome. This notion is supported in that the majority of objectives and activities given as examples were specific in nature.

Morine (1976) investigated the instructional planning of 40 teachers (20 second-grade; 20 fifth-grade). Each teacher was asked to plan and then teach two 20-minute lessons (one reading; one math) on specified content topics. All teachers were given the same topics. Teachers were asked to write down what they thought they would do during the instruction period and they were also told to write in such a way that would "help an observer to understand your lesson more completely." These planning notes were collected at the end of each lesson. After each lesson was taught, the teachers were interviewed and asked to complete one of two tasks, depending upon which lesson (math or reading) had just occurred. At the conclusion of each reading lesson, teachers were shown a videotape of the lesson they had just taught and asked to evaluate what had happened during the lesson and identify any changes they might make in future

planning on the basis of what they saw. In contrast, after each math lesson (not videotaped), teachers were asked to view five prerecorded videotapes showing other teachers using different approaches in teaching the lesson they had just finished. Teachers were then asked (a) to think of any other variations in the approach that might be taken, (b) how students might respond to the various alternatives in comparison to the approach they used, and (c) to describe how they might plan for a similar lesson. It should be noted that gain scores were obtained for all students in each lesson: results using the gain scores will be discussed later.

Two questions were of primary interest in the study. First, in what ways do teachers plan before actual instruction begins? And second, how do teachers evaluate the lesson they have just taught, and if evaluation takes place, how do teachers plan for the next lesson using the evaluation information? The amount of data collected with regard to the two questions was massive and hence, only salient findings will be reported here. In looking at the initial question, lesson plans were coded in two ways: classified first on the basis of general type of plan into categories such as specificity, general format, attention to family background, mention of alternative procedures, and second, individual planning

statements were coded by using The Basic Category System which sorted each planning statement into one of several categories: goals, instructional strategy, teacher activity and pupil activity.

Results indicate that most plans were specific in nature and outline in form. Most goals or objectives were non-behavioral and there was very little attention paid to pupil background or preparation, evaluation procedures, or possible alternative procedures. With regard to planning statements, there were many more specific than general statements made. Statements seemed to indicate an emphasis on the cognitive aspects of the lesson rather than possible affective considerations. Cognitive aspects refer to any teacher planning statement dealing with such things as teacher directions, teacher explanation, teacher summary and review, vocabulary, content focus, pacing/time, pupil ability, pupil background, and ideas.

A more detailed analysis of the cognitive aspects category shows some rather interesting findings. Most teachers mentioned in their planning statements the use of pupil ideas in class. In contrast, few planning statements were made which focused on the specific content to be taught. Similarly, few planning statements were made which mentioned explanations or directions to be given during instruction.

When teachers were asked if they would change anything about the reading lesson they taught, approximately half said they would change some cognitive aspects such as teacher explanations, questioning and use of pupil ideas. No specific subcategory count was given. When asked to explain how they might plan a follow-up lesson to the one taught, teachers consistently mentioned cognitive aspects. Again, no specific subcategory count was given. Hardly any teachers mentioned affective aspects when planning the follow-up lesson. In addition, one-fourth of the teachers mentioned instructional materials when discussing their plans for a follow-up lesson.

Teachers seemed to be able to develop variations to the math lesson which they taught. Less than half the variations were original, however, with the majority being based on the videotaped variations. Teachers also mentioned possible variations in instructional material which might be useful. No other sources of variation were reported. When asked what changes, if any, they would make if they had to reteach the lesson, the majority of teachers said they would make changes in cognitive aspects of the lesson (no specific subcategory count was reported). Also, changes in instructional materials were mentioned, but not as frequently as cognitive changes.

Without knowing which cognitive aspects of the lesson teachers thought should be changed, an interpretation of such results would be premature. For example, it is not clear from the above whether planning was more predictive of the organizational environment or the interactive environment.

It should be noted that teachers answered the above question under the restriction that the new lesson had to be the same length as the old, and that grouping of pupils with regard to ability level was not changed. When these restrictions were removed, most teachers would have changed the grouping procedure and most would have left the length the same.

Peterson, Marx, and Clark (1978) conducted a simpler research effort into the effects of teacher planning on both teaching behavior and student outcomes. Each of 12 teachers was given specific social studies material along with objectives (cognitive and affective) which were the focus of the material. Each teacher was then asked to teach the social studies content, with regard to the objectives, to three different groups of junior high school students on three different days. Each lesson was to last for three hours, and teachers were told they could teach the lesson any way they wanted. Data collection took place in three areas. First, in the 90 minutes prior to the teaching of each lesson

teachers were asked to plan "aloud" for the subsequent instructional period. All planning sessions were tape recorded for later coding. It should be noted that teachers were asked to confine all their planning to these times. Second, both teachers and students were asked to complete four measures of preaptitude (verbal ability, reasoning ability, flexibility of closure, conceptual level), and student outcomes were obtained via a multiple choice test, an essay test, and an attitude questionnaire. Third, lessons were videotaped and coded for instances of teacher and pupil verbal behavior. Four areas of verbal behavior were coded: (a) source and type of communication, (b) focus of the communication, (c) process of the communication, and (d) function of the communication. In relation to the proposed model of preinstructional planning, Peterson, Marx, and Clark (1978) were interested in the direct relationship between planning and the interactive environment.

Findings indicated first of all that teachers planned primarily with respect to the content to be taught and to the specific instructional processes (intended student activities; planned teacher strategies and activities) to be used. Planning statements dealing with content were coded as to whether they dealt with "lower order subject matter (facts)" or "higher order subject matter (concepts, principles, etc.)." In considering content,

teacher planning statements largely focused on low order aspects of the content. As would be expected, content became increasingly less important in planning as teachers taught the second and then third group of students on succeeding days. In contrast, instructional processes, while second in importance to content on the first day, became increasingly more important on day two and on day three, a larger proportion of statements focused on instructional processes rather than content. This result is also not surprising. Very few planning statements were found to be influenced by the specific materials used, the objectives given, or the students themselves. The fact that the majority of teacher planning statements on the first day dealt with content is in agreement with Zahorik (1975). However, the shift from content to instructional process focus on the last two days is more indicative of the planning model proposed.

In relating planning categories to teacher behaviors, several findings emerge. The proportion of objective related planning statements was inconsistently associated with the proportion of behaviors classified as goal setting behaviors, although consistency did increase from day two to day three. This result is curious since it would seem that objectives and goal setting would go hand in hand. Peterson et al., interpret this as a possible artifact of the experimental procedures. That is, since objectives were given to all teachers on the first day, perhaps even those teachers who did not generally use objectives when

planning felt that goal setting behavior was being asked for. Hence, more goal setting behavior was evidenced the first day by teachers who planned using objectives and by those who did not. The number of planning statements dealing with content was consistently related (positively) to teacher behaviors categorized as "subject matter focus" for all three days. Instructional process planning statements were positively related to teacher behaviors which were targeted toward the whole group.

Planning statements dealing with the learner were positively correlated with teacher behaviors classified as group focus. In contrast, there was little correlation between planning statements dealing with the learner and teacher behaviors classified as person focus. Learner planning statements were defined as those that "account for one or more specific aspects of students' cognitive development, cognitive ability, ability to respond to a cognitive task, or their equivalents in the affective domain." Apparently, even when teachers showed a certain awareness of learner aptitudes when planning, such awareness was limited to the entire group rather than to individual students. Teachers most probably formed an overall picture of the cognitive level of

the group and proceeded in that fashion. In view of the limited scope of the study, and the unfamiliarity of teachers with students, such a conclusion is not surprising. It would be interesting to test the above hypothesis for an extended period of time to see if changes in planning from group to individual occur.

Results reported with regard to achievement are confusing and inconsistent. For the second and third days, one pattern seems to have occurred, however: the more teachers planned, student achievement became worse; findings are consistent across all outcome measures. Also, more teacher planning was indicative of poorer student attitude, first, toward the teacher and what was taught as well as how it was taught, and second, toward the students themselves. Such a pattern is a logical extension of Zahorik's (1970) finding that teachers who plan are generally insensitive to student ideas.

According to the model of planning proposed, the relationship between teacher planning and student achievement is not direct. Several mediating variables are suggested. Studies (Moline, 1976; Peterson, Marx & Clark, 1978) which have attempted to predict student achievement directly on the basis of planning have not been successful. In Moline's study, gain scores were based on a 20-minute lesson, and the validity of such achievement measures is questionable. The planning model would indicate that such a

conclusion is not surprising. The mediating variable proposed, engaged time, has been the focus of a substantial research effort carried out by Far West Laboratories and entitled The Beginning Teacher Evaluation Study (Fisher et al., 1978). The general hypothesis of the investigation pointed to the inadequate predictive power of teacher classroom behaviors with respect to student achievement. Instead, it was felt that teacher classroom behaviors were more predictive of a variable which was labeled student academic learning time.

It is important to notice that rather than achievement, academic learning time is now used to assess the effects of planning. In turn, academic learning time is predictive of achievement. Significant relationships found between planning variables and academic learning time are not clear since the planning variables studied were non-specific in nature. The notion that how teachers plan affects how much time students spend actually learning is intuitively appealing.

It should be said here that the notion of engaged time as a dependent variable of its own, irrespective of student postachievement, cannot be overestimated. Berliner (1979) and Romberg (in Romberg, Small & Carnahan, 1979) have both alluded to the use of engaged time as an index of how effective the classroom setting is in getting students to attend to their work. As Berliner suggests, if students learn primarily when they attend to instruction, then engaged time and what affects it, becomes increasingly important.

In a more naturalistic, observational study of teacher planning, Yinger (1978) attempted to formulate a theoretical model of teacher planning by examining three questions: How do teachers plan over extended time periods in natural settings? Are there different kinds of problem solving and decision making that go on when teachers plan? Can a model of teacher planning be formulated by answering the previous two questions? To address these issues, Yinger developed a "detailed descriptive case study" on one teacher's planning behavior over a five-month period of time. Data collection was in two parts. In the first 12 weeks, extensive notes and observations in regard to teaching behavior, both before instruction and during instruction, were gathered. At times when students were not in the classroom, the teacher was asked to "think aloud" when thinking about the classroom in any way. When the teacher formally planned, verbalized thoughts were tape-recorded. The second aspect of data collection occurred when the teacher participated in a simulated task called the "Teacher Planning Shell." In contrast to most simulation tasks in which teachers are asked to plan in unfamiliar circumstances, the "Teacher Planning Shell" allows the teacher to plan under circumstances which are familiar. For example, the teacher could be asked to plan a new curriculum topic for use with his present students. Yinger posits

several advantages in using such a procedure. First, teacher planning in this instance is a much more valid indication of planning actually done. Second, the use of the technique is easier for teachers since they are already familiar with most information needed to plan. And finally, different planning problems may be presented under the same general format. In his study, Yinger gave four planning problems to the teacher. The results were used to refine the theoretical planning framework Yinger had developed from his extensive observations.

Two basic notions about teacher planning emerged. First, specific activities were important in planning and second, Yinger found consistent patterns of behavior that his teacher used to "increase the predictability and to reduce the complexity of the teaching environment" which he called "teaching routines." These routines would be categorized in four ways: (a) activity routines, (b) instructional routines, (c) management routines, and (d) executive planning routines. Activity routines deal with the specific handling of the activities which go on in classrooms. Instructional routines are basically the ways in which teachers actually behave while teaching the content. Management routines are ways of dealing with aspects of the classroom not related to the ongoing activity. Executive planning routines are

methods which influence how the teacher plans. Yinger saw these routines active in two areas. They allowed the teacher to deal with a more simple environment which made decisions easier. But they also allowed the student to be more secure in the classroom, since it was more predictable.

Yinger also suggests two basic models of classroom planning: a structural model and a process model. Levels of planning viewed by the structural model include yearly, term, unit, weekly, and daily. Yinger notes important areas of research are to be found when one looks at the points where the levels interact with each other. For example, when the school term began, interaction of yearly and term planning was evident. As school progressed, interactions among daily, weekly, and term planning emerged. Yinger suggests that interactions in planning are important since in his study, planning was more apparent at these times.

In contrast, the process model represents components of teacher planning which occur at any level. Three components are hypothesized: (a) problem finding, (b) problem formulation/solution, and (c) implementation, evaluation, and routinization. With regard to teacher planning "problem finding refers to the discovery of a potential instructional idea that requires further planning and deliberation." After the problem is "found" it must

be "formulated" and then "solved." It is here where the actual description of the problem, as well as the analysis of possible procedures for dealing with the problem take place. Finally, the chosen procedures are "implemented," their results are "evaluated," and if judged successful are "routinized."

Yinger's data were not as clear cut with regard to the findings of other studies, namely, that content was a major focus of teacher planning. As Yinger reports, however, activities were very influential in planning behavior. One possible reason why content was not salient was the fact that content was not always distinguished from activity; "activities did not exist apart from some subject matter." When activities are considered to subsume such a variety of characteristics as content and materials, it is not surprising that activities play such a major role. One should also keep in mind that all of the above were based on observations of only one teacher in an uncontrolled situation. Such theory building, however, is not unprecedented (cf. Piaget).

McCutcheon (1979) has given us a closer look at just how the teacher views the purpose of the planning he/she does. Most teachers McCutcheon interviewed thought of the written planning they did as a type of "memory jogger." In essence, the written plan is a brief outline which represents considerably more complex

mental planning which has already occurred. Such an interpretation is consistent with the finding that teacher written plans in this study tended toward the "grocery list" format in which only brief phrases and many times only single words were used to describe what is to happen in the classroom. It is interesting to note that most teachers used this fact to explain why such things as objectives were not generally listed in written lesson plans; such objectives were internalized and activities listed in the written plans pointed toward those objectives. In the view of one teacher, activities were useless unless they expedited the accomplishment of an objective. One other result of McCutcheon's investigation, and one which has direct implications for the results of this present study, bears mention.

Alternative procedures were very rarely mentioned in teachers written lesson plans. Indeed, teachers indicated that alternatives were very rarely considered even in prior "mental" planning. Teachers gave several reasons for this: (a) ideas which have worked well in the past are the ones used, (b) limited planning time implies the acceptance of the first procedure thought of, (c) alternatives interrupt routines which teachers establish to make things easier on them, (d) alternatives are chosen on a year to year basis depending on the class' character, and (e) teachers

seem to "know" what will work best with their kids; any other alternatives are rejected. These findings are important in light of the hypothesized relationship of teacher planning for individual students and student achievement. If very few or no alternative instructional methods are considered by teachers, it would seem that the chances of dealing effectively with individual student differences are minimized.

The model of teacher planning summarized earlier suggests that teacher preinstructional planning is affected by information about student aptitudes which is available to the teacher. In turn, preinstructional planning is predictive of both the organizational and interactive classroom environments. The investigations discussed above indicate that indeed, teacher planning does predict the organizational and interactive environments.

With regard to the effects of planning on the organizational environment as indicated by the model, it is expected that teachers who are given motivation strategies which might be useful in the classroom, will plan differently than those teachers who are not given such strategies. The means by which teachers attempt to motivate students are many, and a great deal of research has examined the effectiveness of such strategies in promoting student learning and more specifically, student achievement.

"Individually Guided Motivation" (IGM: Klausmeier, Jeter, Quilling, Frayer & Allen, 1975) was designed to be compatible with the "Individually Guided Education" (IGE) framework developed at the University of Wisconsin Research and Development Center for Individualized Schooling. As its name indicates, the purpose of IGM is to develop a "motivational-instructional program" for each student based on prior assessment of that student's motivation and achievement level. The program is designed with the help of the student for whom it is meant. Four instructional procedures were developed to help implement the motivation program, once designed. The procedures are: (a) adult-child conferences to encourage independent reading, (b) teacher-child conferences for goal setting, (c) guiding older children in tutoring younger children and (d) guiding children toward self-directed prosocial behavior. Several teacher classroom behaviors such as providing feedback, focusing student attention and reinforcing desired behavior are thought to be important in the implementation of the programs. Several studies (Gaa, 1970; Kennedy, 1968; Quilling, Fischbach, Rendfrey & Frayer, 1971) have demonstrated the effectiveness of individual goal-setting conferences in predicting achievement gains. Peer tutoring has also been found to increase achievement (Quilling, Cook, Wardrop & Klausmeier, 1968).

Johnson and Johnson (1974a, 1974b, 1975, 1978) suggest classroom "goal structures" are essential in any attempt to motivate students. They define a goal as "...a desired state of future affairs." In most classroom situations this would likely refer to completion of an assignment, obtaining a grade or the accomplishment of some larger objective. Goal structures, then, are organizational means whereby the teacher facilitates student movement toward goal completion. As Johnson and Johnson state, "A goal structure specifies the type of interdependence existing among students as they work towards goal accomplishment." (Johnson & Johnson, 1974b, p. 30.) Johnson and Johnson propose three goal structures: cooperative, competitive and individualistic. Cooperative structures are ones in which "...students perceive that they can obtain their goal if, and only if, the other student with whom they are linked can obtain their goal." Competitive structures are ones in which "...students perceive that they can obtain their goal if, and only if, the other students have failed to obtain their goal." Individual structures occur when the achievement of a goal by a student is in no way dependent upon other students. Cooperative goal structures are most effectively implemented through the use of heterogeneous small grouping in the classroom. Small groups can also be used to implement competitive goal structures.

Several investigations have examined the influence of goal structures on student motivation and achievement. Students in cooperative goal structures have (a) shown higher attitude and achievement levels than students in competitive and individualistic structures (Johnson & Ahlgren, 1976; Johnson, Johnson, Johnson & Anderson, 1976), and (b) have shown increased problem solving ability over students not in cooperative structures (Johnson, Skon & Johnson, 1980). In addition, competitive goal structures have been found to be positively related to student motivation in grades 10-12 (Johnson & Ahlgren, 1976).

Not much needs to be said about the use of games appropriate to the content being taught for motivating students. Not only are games motivating but they also can be effective in increasing cognitive outcomes (Bright, Harvey & Wheeler, 1977). Johnson (1975), however, has argued that games, to be effective, must be used in a planned, organized manner. It should be noted that the motivation strategies mentioned above are pedagogical in nature and certainly do not reflect all aspects of psychological motivation theory.

The model proposed earlier predicts motivation strategy information given to teachers will influence the quality of written planning done. There is no evidence from which such a prediction can be inferred. However, it seems reasonable to suggest that

information about certain motivation strategies and their usefulness in dealing with students who are not motivated could affect written planning done by teachers. In light of the above research and due to the ease with which they could be implemented in the classroom, three motivation strategies were chosen as those about which information would be given to teachers. They include heterogeneous small grouping for cooperation, inter- and intragroup competition and the use of games and/or puzzles. With regard to games/puzzles, the mathematics topic which was taught included games/puzzles appropriate to the content.

The following sections will describe work which (a) has identified certain types of student background information which teachers use when they plan, and (b) work which has attempted to deal with the quality of the interactive classroom environment as measured by teacher clarity of presentation.

Student Background Information

The planning model described earlier suggests that when background information about students is made available to teachers, such information influences teacher planning. So far, little is known about the types of student information teachers use when planning.

Morine (1976) asked individual teachers to plan a year long

reading program for 14 children, on the basis of available information about the children including health, attendance, family background, achievement, teacher comments, and the like. However, teachers could only use information which they requested. Information most requested by teachers in planning the reading program included prior achievement, previous reading programs the student was involved in, family background data, and teacher comments. Information considered of secondary importance included health and attendance, IQ tests, and psychological reports. It is interesting to note that achievement information was most often requested first. Most teachers also indicated they would plan the program using specific grouping procedures, variation in instructional materials, and use of support services. After the task was completed, teachers were asked how closely the simulation task agreed with actual long-range planning they had done. The teachers indicated substantial differences. In actual planning situations, teachers were used to planning with others rather than individually, using first hand information rather than filed information, and using previous teacher's comments.

Shavelson, Cadwell and Izu (1977) simulated a teacher decision making situation in which both teachers and non-teachers were presented with background information about a hypothetical

student and then were asked to make several judgments about that student relating to instructional and performance situations.

All subjects were first given information regarding the father's occupation, student use of time outside of class and student general intelligence. All information given to subjects was systematically varied in two ways: (a) whether the information was positive or negative and (b) whether the source of information was reliable or unreliable. After information had been given, all subjects were asked to make judgments in four areas: (a) estimate the student's final grades, (b) what types of instructional materials would the subject use with the student, (c) what response would the subject make if the student hesitated when asked to answer a question and (d) how important is praise for the student. After subjects had made their judgments, additional student information (academic ability, curiosity and attitude toward school; again varied) was given and subjects were again asked to make the same judgments.

Results indicated that estimates of student performance were influenced by the reliability of information given and that when additional information was given, estimates were revised. In addition, whereas the first judgment of what materials to use was most influenced by student ability information, the second judgment was influenced by (a) the first estimate of student performance, (b) reliability of new information and (c) the previous decision

about materials. With regard to judgments about teacher response and praise, results indicated no significant effect of information on those decisions. The authors suggest these decisions may be based on factors such as teaching philosophy and preferences toward teaching method.

Clark, Yinger and Wildfong (1978) tried to identify cues which teachers use in making judgments about the effectiveness of certain language arts activities with students they had taught most recently. Teachers were given descriptions of several activities which they might use and then were asked first, to rate the activity as to the probability of its use, and second, to list features which were influential in making the decision. Results showed the most frequent consideration in deciding whether an activity would be used was student motivation and involvement. In other words, how motivating would the activity be.

Clark and Yinger (1978) report an investigation done by Joyce, Morine-Dershmer and McNair (1977) in which teachers were asked to sort their students into two or more categories and then describe why they sorted the way they did. Several categories emerged. Students were sorted with regard to student personality and involvement, student ability and achievement, peer relationships, performance in particular activities and student growth and progress. The most frequently used category was student

involvement.

The above studies suggest although many types of student information are used by teachers, few types of information are used by all teachers. What this implies is that individual teachers may rely on certain types of student information to help them plan or make judgments depending upon the expectations they have formed with regard to the information's perceived importance. In addition, research has indicated that information about students used most likely activates teacher expectations of how those particular students will perform (see Braun, 1976).

It is interesting to note that when teachers use student background information as they plan, the types of information they use are varied; however, the studies reviewed earlier dealing with teacher planning suggest teachers infrequently use such information when they plan. It is possible that teacher planning which is done at the beginning of the school year, rather than later in the year, may reflect greater use of student background information since teachers are generally unfamiliar with their new students. In addition, it might be the case that later in the year students have already been grouped according to ability. As such, the teacher assumes that all students in the class are

similar and so the teacher no longer feels that student information is an important factor.

Teacher Clarity of Presentation

This study is interested in looking at how teacher written preinstructional planning affects the classroom interactive environment, but more specifically how written planning influences the quality of the interactive environment as measured by teacher clarity of presentation. It is expected, as well, that teacher clarity of presentation will be predictive of student engaged time, but through the mediating variable of student perception of teacher clarity.

The notion of teacher clarity of instruction as an important teacher process variable has both theoretical and empirical support. Carroll (1963), in discussing his "Model of School Learning," defined quality of instruction as "...a measure of the degree to which instruction is presented so that it will not require additional time for mastery beyond that required in view of aptitude." (p. 729). Carroll defines student aptitude in this instance as the pupil's "ability to understand instruction." Carroll's "quality of instruction" includes aspects of both the organizational and interactive classroom environments. This investigation is examining quality of instruction as measured by teacher clarity of

presentation. As Carroll points out, however, a problem emerges when one tries to objectively define quality of instruction (in this study teacher clarity) in terms of specific teacher behaviors or classroom processes.

It has been difficult to identify specific teacher classroom behaviors which can be subjected to unbiased observation, and yet give a valid and reliable estimate of clarity of presentation. Earlier work has attempted to examine clarity of presentation in terms of (a) effectiveness in explaining as measured by such teacher behavior variables as rapidity of speech, number of pauses and verbalized breaks, use of chalkboard, teacher gestures, word length, word relevance, explaining links (that is, prepositions and/or conjunctions which indicated causation), and rule-example-rule pattern of teacher presentation (Rosenshine, 1968 in Westbury & Bellack, 1971, chapter 9), (b) the amount of structuring a teacher does just prior to and immediately after asking a question in class, the total amount of structuring done, the percentage of closed questions compared to the percentage of open questions asked, the use of summary review at the end of the lesson (Wright & Nuthall, 1970), and (c) teacher use of conceptually vague words: for example, some, many, might, maybe (Dunkin, 1978; Dunkin & Doenau, unpublished manuscript; Hiller, 1971; Hiller, Fisher & Kaess, 1969).

In all the above investigations, certain teacher behaviors thought to be indicative of teacher clarity of presentation were found to be significantly correlated with student achievement. Rosenshine found that the amount of teacher gesturing, the number of explaining links used by the teacher and the use of rule-example-rule pattern of presentation, were positively related to student achievement. Wright and Nuthall (1970) reported evidence that teacher structuring, that is, information given after an interaction begun by a question, in contrast to asking two or more questions in immediate sequence, and the use of summary review at the end of a lesson, were positively correlated with student achievement. Dunkin (1978) and Dunkin and Doenau (unpublished manuscript) have shown that teacher vagueness, as measured by the number of conceptually vague words a teacher uses in class, is negatively related to student achievement. In none of the above studies, however, were live classroom observations attempted or were student perceptions of teacher clarity of presentation obtained.

Other work (Bush, Kennedy & Cruickshank, 1977; Kennedy, Cruickshank, Bush & Meyers, 1978) has begun to deal with the issue of teacher clarity in a different fashion. In the two investigations, ninth-grade students were asked to think of both their most clear and most unclear teacher, and then list classroom behaviors associated

with each of the teachers. The resulting list of 110 distinct (low-inference) behaviors were factor analyzed. The four factors, and representative examples of teacher classroom behaviors for each, which emerged were: (a) assesses student learning (for example, tries to find out if we don't understand and then repeats things), (b) provides student opportunity (for example, explains something and then stops so we can think about it), (c) uses examples (for example, goes over difficult problems on the board), and (d) reviews and organizes (for example, describes the work to be done and how to do it). The above four factors were found to be consistent across three samples of students (Ohio, Tennessee and Australia).

As mentioned earlier, it is hypothesized that observed teacher clarity of presentation will influence the amount of student engaged time, but through the mediating variable of student perception of teacher clarity. Cronbach and Snow (1977) have reviewed evidence which suggests that variance in student performance may be influenced almost as much by student perception of teacher behaviors as by the actual behaviors themselves. It is expected then, that student perception of teacher clarity of presentation will directly influence the amount of time the student actually spends learning.

On the basis of the literature just reviewed and the resultant model of teacher planning proposed earlier, the primary questions to be examined in this study are:

1. How does aptitude information about individual students given to teachers affect the preinstructional planning a teacher does" It is expected that teachers who are given information about their students will evidence the use of such information in their planning.

2. Do teachers who are given motivation strategies to use with individual students, plan differently than teachers who are not given such strategies? It is expected that quality of teacher written preinstructional planning will be influenced by motivation strategies given to teachers.

3. Is quality of preinstructional planning related to how motivation strategies are used in the classroom? It is expected the frequency of motivation strategy use in the classroom will be predicted by the quality of teacher written preinstructional planning.

4. How is the quality of preinstructional planning a teacher does related to observed and student perceived teacher clarity of instruction? It is expected that quality of teacher written preinstructional planning will predict both observed and student perceived teacher clarity of presentation.

5. Is the use of motivation strategies in the classroom related to the amount of student engaged time? It is expected that the use of provided motivation techniques will predict student engaged time.

6. How is teacher clarity of presentation related to student engaged time? It is expected that both observed and student perceived teacher clarity of presentation will predict student engaged time.

Chapter 3

Method

This chapter describes in detail the sample, materials and procedures of the study.

Sample

Nine fifth-grade mathematics teachers (eight male, one female) from seven schools volunteered to participate in the study which began one week after the beginning of school in September, 1979. All teachers are employed by one school district located in a moderately sized Midwestern city. All participating teachers were experienced, with years of teaching ranging from 8 to 24. Each teacher's class was intact in that the students in each class had been assigned to that class prior to the beginning of the school year. The number of students in each class along with the number of years teaching experience for each teacher are given in Table 1.

For purposes of in-class observation, eight students from each of the nine classes (with the exception of class nine in which only seven students were available for observation) were chosen as "target" students on the basis of three pieces of information: (a) mathematics competency test scores obtained for each student at the conclusion of his/her fourth-grade school

Table 1

Teacher Experience, Mathematics Class Size, Treatment Group
and Observer Assignments for Participating Teachers

Teacher	Teaching experience (years)	No. students	Treatment	Observer
1	24	34	3	1
2	18	33	2	2
3	16	22	1	3
4	10	29	1	4
5	20	20	2	3
6	8	26	3	3
7	13	21	1	5
8	17	17	3	5
9	13	7	2	5

year, (b) an index of mathematical problem solving ability obtained just prior to the beginning of the study and (c) an index of student attitude toward mathematics also obtained just prior to the beginning of the study. The latter two measures were obtained four days before instruction began. Descriptions of these instruments are found in the next section.

An overall prior achievement index was obtained for each

student by combining fourth-grade mathematics competency and problem solving scores (see Appendix I for description of data and procedure used). Within each class a median split procedure was used to identify which students could be classified into one of four categories: (a) high prior achievement/high motivation, (b) high prior achievement/low motivation, (c) low prior achievement/high motivation, and (d) low prior achievement/low motivation. Two students from each category were chosen as "target" students to be observed in each class if their scores on both prior achievement and motivation measures were farthest (either high or low) from the median for each measure. For example, a student was chosen for category (a) if his prior achievement and motivation scores were both farthest away from the respective medians in a positive direction. It should be noted that in some classes, some categories only contained two students. In such cases, it was not possible to choose those students who scored farthest away from the median on both prior achievement and attitude toward mathematics measures. The median split was done within class since it was clear that classes differed in average ability.

Materials

Preinstructional Measures

Three preinstructional measures of student aptitude were

obtained four days before instruction began: (a) a measure of mathematical problem solving ability, (b) a measure of mathematical competency (achievement) and (c) a measure of preinstructional student attitude toward mathematics. Copies, as well as class means and standard deviations obtained for each of the preinstructional measures are given in Appendix E.

Mathematical problem solving ability was measured using a 66-item instrument developed by Wearne (1976). Published instrument reliability was Hoyt (.84) and KR-20 (.79). In the present study, a value of .90 for Cronbach's α was calculated. The test contains "superitems," each of which contain a question on comprehension, one on application and a problem solving question. As Wearne states, "The comprehension question assessed the child's understanding of the information contained either implicitly or explicitly in the item stem. The application question assessed the child's mastery of a prerequisite concept or skill of the problem solving question; this question was a fairly straightforward application of some rule or concept to a situation. The third question in the set was the problem solving question." (Wearne, 1976, p. 22.) The overall score for each of the superitems was that score used in the analyses of the present study.

A measure of mathematical competency was obtained from scores made available by the school district. The district had done

mathematical competency testing at the end of these students fourth-grade school year in an attempt to help evaluate certain aspects of the ongoing mathematics curriculum for grades one through four. The district had also developed the test through close cooperation of teachers and curriculum specialists. The 75-item test included all areas of mathematics instruction presumed covered during those four years. No reliability estimates for the test have been gathered. Again, although the test can be broken down into several subscores, an overall score was used for these analyses.

Preinstructional attitude toward mathematics (used to assess student motivation toward mathematics) was measured using a 15-item Likert-type questionnaire developed by Peterson and Janicki (1979) with reported reliability of Cronbach's $\alpha = .89$ ($\alpha = .88$ for this administration). A five-choice response scheme is used ranging from "Strongly Agree" to "Strongly Disagree." An example of an item from the questionnaire is, "I like anything that has to do with math." Items were scored such that a higher score reflected high motivation. The student's final score was the total of all 15 items. The questionnaire was adapted from the Science Attitude Inventory developed by Klausmeier, DiLuzio and Brumet (1976).

Outcome Measures

Three instruments were administered to students at the conclusion of the two-week period of instruction: (a) an achievement test in mathematics appropriate to the mathematics topic taught, (b) a questionnaire designed to assess student postinstructional motivation level toward mathematics and (c) a questionnaire designed to measure student perception of overall teacher clarity of presentation for the two-week topic. Copies, as well as class means and standard deviations obtained for each of the postinstructional measures are given in Appendix F.

The test used to assess student achievement for the two-week topic on equivalence, addition and subtraction of fractions was developed by Peterson and Janicki (1979) and adapted from the standardized test which was originally designed for the topic (Romberg, Harvey, Moser & Montgomery, 1976). The new test included some items felt to be somewhat more difficult than those in the original test. The test used in this study included 35 items which required students to solve computational exercises, addition, subtraction, changing mixed numbers to improper fractions, as well as word problems involving fractions. The test was given the day following the conclusion of the ten-day instruction period. Internal consistency for the test as measured by Cronbach's α was .94.

The questionnaire designed to measure student postinstructional motivation toward mathematics was identical to that given prior to the beginning of instruction and was given the day following the two-week instructional period. Cronbach's α in this case was .91.

The 32-item instrument used to measure student perception of teacher clarity was designed specifically for this study and was also given the day after the two-week instructional period. Some items were adapted from Thompson's Pupil Rating of Teacher Scale (Thompson, 1969) and Davidoff's Student Opinion Survey (Davidoff, 1970). In addition, items were written which reflected work mentioned earlier (Bush, Kennedy & Cruickshank, 1977; Kennedy, Cruickshank & Meyers, 1978). All items were in Likert-type format with a 5-choice response scheme ranging from "Never" to "Always." An example of an item from the questionnaire is, "The teacher explained things slowly so that I could understand them." Items were scaled so that a high score represented the student's perception of the teacher as being very clear. The student's final score was the total of all 32 items. An internal consistency of .84 was obtained for the questionnaire using Cronbach's α .

Observation System

The measurement of certain teacher and student classroom behaviors as well as aspects of the classroom organizational environment was accomplished through the use of an instrument designed for this study. Only teacher verbal behaviors related to the content being taught were observed. Teacher verbal behaviors were separated into six categories thought to be representative of verbal teacher clarity of presentation. Briefly, the six categories included outlining objectives, explaining what to do next, relating present content to past and/or future, summarizing or reviewing, repeats question or explanation and emphasizes important points. In addition, a seventh category was used to code any teacher verbal behavior, related to content, which could not be coded as any one of the other six categories.

Student behavior categories included only whether the student was engaged or off-task and whether the student was listening to the teacher at any particular instant coded.

Organizational parts of the classroom environment which were observed included the particular student grouping structure the observed student was in at a particular instant, whether that student was using mathematics games and/or puzzles, and whether that student was involved in some form of competition related to

mathematics. The organizational aspects of the classroom observed reflected information about the three motivation strategies given to three of the participating teachers. Observers were provided with an observation manual which explained in detail coding procedures as well as category definitions, and gave hints and examples on how and what to code.¹ The observation instrument as well as the observer's manual can be found in Appendix C.

Curriculum Materials

All students were taught an introductory mathematics topic dealing with fractions (Topic 71: Common Fractions) taken from the curriculum series Developing Mathematical Processes (DMP: Romberg, Harvey, Moser & Montgomery, 1976) designed for grades K-6. DMP is different from other elementary mathematics curriculum programs. In DMP, a "hands on" approach to the teaching of mathematics is basic. A variety of activities and materials are available which encourage each student to participate as actively as possible. In addition, children use the materials provided to solve problems which draw on the child's own experience. The program is flexible and designed to be used so that individual student needs are best met. All written materials for Topic 71 can be found in Appendix G. All materials, teacher guides, student guides, student workbooks, games, and manipulatives, necessary

¹See pages 65-70 for a description of the observation procedures used as well as the observers who participated.

to the topic but not readily available to the teacher were provided. These materials were different than any of those being used at the fifth-grade level in this school district at this time. All teachers, with the exception of one who had limited previous experience with DMP materials at an earlier grade level, were completely unfamiliar with the materials. The topic had been chosen by the experimenter and judged positively by the Director of Curriculum and the two Mathematics Curriculum Specialists for the district, in that the topic was felt to be one which could be taught at the beginning of the school year to new fifth-grade students.

Procedure

Experimental Treatments

To manipulate the variables of student information and of motivation strategies given, three experimental conditions were used to examine the effects of availability of information and motivation strategies on teacher planning and subsequent classroom behavior. In the first treatment, three teachers were given both student background information and information about motivation strategies which might possibly be used with their students. Information with regard to student prior achievement and student motivation toward mathematics had not been made available to the

teachers prior to the beginning of the study. Some classes had already been assigned on the basis of achievement data gathered during the fourth-grade year, and those teachers were generally aware that the students in their classes were either high or low mathematics ability. However, teachers were not aware of actual student scores. Student information provided to teachers was not in the form of raw scores. Teachers were only told in writing whether each student of theirs had scored high or low on both prior achievement and mathematics motivation measures in relation to the remainder of the class.

Treatment two was different from treatment one in that teachers in treatment two were only given achievement and motivation information about their students. They were not given any information about motivation strategies or their use in the classroom with particular students or groups of students. Student prior achievement and motivation information was given to teachers in treatment two in the same form as that given to teachers in treatment one.

Treatment three differed from both treatment one and treatment two in that teachers assigned to treatment three were given neither information about their students' prior achievement or motivation towards mathematics nor were they given information

about motivation strategies to use in the classroom.

Motivation strategies given to teachers in treatments one and two included information about the use of (a) games and puzzles, (b) small groups and (c) competition as motivation techniques in the classroom. The handout which was prepared for teachers in treatment one can be found in Appendix G. Even though information about motivation strategy use was given only to teachers in treatment one, all games and puzzles appropriate to the mathematics curriculum unit were made available to all teachers.

The nine participating teachers taught in seven different schools: one teacher in each of five schools and two teachers in each of the remaining two schools. All teachers were randomly assigned to one of the three treatments, taking care that teachers teaching in the same school were not assigned to the same treatment. Table 1 (p. 52) shows which teachers were assigned to which treatments. Mathematics was not held the same time each day for all nine classes. Due to practical constraints, scheduling of classes was accomplished with the convenience of the teachers, administrators and observers in mind. After scheduling had been completed, each class met the same time every day for the remainder of the study.

Teacher Training Sessions

Training for teachers in treatments two and three (information/no motivation strategies given; no information/no motivation strategies given) was somewhat different than training given to teachers in treatment one (information/motivation strategies given). As a result, training given to all teachers will be described first.

Six days prior to the beginning of the study, the experimenter met with all teachers together to talk about the curriculum materials the teachers would be using as well as general features of the study of which all teachers should be made aware.

All curriculum materials were described in detail in terms of their relationship to the topic being taught and their relationship to the entire DMP curriculum. Each of the activities in the topic was carefully outlined with emphasis placed on the particular objectives which were the focus of each of the activities. It was clearly stated that the suggested sequence of activities indicated by the teacher's guide was only a suggestion and that teachers should feel free to alter the sequence in any way which they felt might be beneficial to any or all of their students. It was also made clear that teachers could, should they choose to do so, supplement the materials with manipulatives,

worksheets, etc. of their choosing provided that the basis for such supplementation was the materials given them. At the conclusion of the study, the majority of teachers indicated they tried to follow the materials closely.

All teachers were told that the achievement test given at the end of the two-week instructional period would primarily cover the first five activities in the topic and they should plan to complete as many of those activities as possible.

Teachers were also told they should record (either written or orally) any mathematics lesson plans which they made for the duration of the study, and that the lesson plans would be collected at the conclusion of the instructional period. Although provision was made for teachers orally recording their lesson plans, all teachers opted for written plans as a means of recording. Teachers were informed that no restrictions would be made on the format of their planning, and that no special effort should be given to the writing of their lesson plans.

In addition to the aspects of training described above in which all teachers took part, three teachers who were assigned to treatment one (information/motivation strategies given) were also given information about particular motivation strategies (small groups, competition and games/puzzles) which research has shown

to be effective in dealing with students. The three teachers were given a handout (see Appendix G) which explained the theoretical background as well as the classroom application of each of the motivation strategies chosen. The handout was discussed and questions the teachers had were answered. It was emphasized that the motivation strategies would be most useful when the teacher made use of the student information which would be given them. It was also made clear that the teachers who were given this information were in no way obligated to use it. The strategies discussed were merely suggestions of possible techniques which might prove useful in dealing with certain students in class.

As mentioned earlier, the only materials necessary to any of the motivation strategies were the games and puzzles included in the curriculum materials. All games and puzzles were made available to all teachers; only information about their use was provided to the three teachers in treatment one.

Observer Training and Observation Procedure

Observer training took place over a consecutive two-day period the week prior to the beginning of instruction. The five observers consisted of two mathematics curriculum specialists from the district as well as three principals of schools participating in the study. All observers were male and had many years of

teaching and administrative experience. Some of the observers also had previous experience coding classroom verbal interaction with the Flanders Interaction Analysis System. Originally, only the two mathematics specialists were scheduled to be observers. However, due to class meeting time restrictions and problems of class location, it was felt that two observers would not be adequate to cover all classes every day. Three more observers (school principals) were then recruited to observe those classes whose location presented the largest problem with regard to transportation. As a result, two observers coded three classes each, and three observers coded one class each. An observer was assigned to a class or classes solely on the basis of the ease with which the observer could meet with that class each day. Each teacher was familiar with the coder in his/her particular class. Table 1 (p. 52) shows which observers were assigned to which classes. Observers 1, 2 and 4 were principals who observed in their own schools, and observers 3 and 5 were curriculum specialists.

On the first day of training only the two observers who were mathematics specialists were present. This part of the training consisted of discussing the general observation procedures to be used in addition to category definitions, as outlined in the observers manual which had been written specifically for this study. The observers manual can be found in Appendix C.

In this part of the training, emphasis was placed on the

observation form and the particular format to be used in coding classroom behavior. Since the observers had not had a chance to read the manual prior to the training session, they were asked to do so and return the next day with any questions they might have.

All observers, specialists and principals were present the second day of training. This training session was separated into two parts: (a) the background information and explanation of the observation procedures and categories to be observed were repeated since three of the observers had not participated the day before, and (b) the practice coding of actual classroom behavior from videotapes, using the observation coding form. Actual practice coding of classroom behavior was preceded by the presentation to all observers of a 15-minute videotape which provided examples from classroom situations of all behavior categories to be coded. All examples were clearly labeled on the screen as to what type of behavior each represented. This tape was stopped periodically and discussion of the example or examples, including further elaboration, took place. When all examples had been shown and discussed, observers were asked to view and code several instances of classroom behavior from videotapes which had been prepared for observer training in a previous study (Small, Romberg & Carnahan, 1979).

At first only one instance of classroom verbal interaction was shown and observers were asked to code that instance. Discussion followed leading to a consensus of opinion as to what the proper coding should have been. Segments of classroom behavior viewed for coding became longer until observers were coding approximately five-minute segments at a time. Observers were told that if they had questions about any behavior, either student or teacher, which they viewed, a note should be made so that later discussion could take place. Viewing of videotapes and discussion continued until all observers felt at ease with the coding procedures and their understanding of the behaviors they were to be coding.

At the conclusion of the training session, the three observers who had not been present the day before were asked to read the observers manual. The experimenter then met with those three observers individually the following day and answered any questions they had.

It was originally intended that observer training should conclude with in-class, live practice observation. However, due to time and other practical constraints, such practice was not possible.

Live, in-class coding procedures were similar to those used in other work of this type (Fisher et al., 1978; Small, Romberg &

Carnahan, 1979; Webb, 1979). A time-sampling procedure was used in which each of eight "target" students was observed in a particular sequence at different moments throughout the observation period. The sequence in which the eight students were observed was fixed prior to the beginning of the observation period and was invariant while observations were taking place. The teacher was coded for instances of relevant verbal behavior each time a target student was observed. The observation of all eight students (along with the teacher eight times) represented a coding cycle approximately four minutes long. It was estimated that 30 seconds were needed: (a) to observe the target student's behavior, (b) to observe the teacher, (c) to observe the organizational aspects mentioned above, and (d) to code the appropriate categories on the observation form. The behavior to be coded consisted only of those activities the teacher and pupil were involved in precisely at the beginning of the 30-second time interval. It was expected that through this process, observer bias in sampling moments would be minimized. The coding categories were used to record a description of what was occurring at that one instant for both the target student and the teacher. In this way a series of "snap shots" would be obtained which would give a running account of what took place in the classroom for a

particular observation period.

Observation for a class session began when mathematics instruction began, and ended when mathematics instruction for that class session ended. Not always did the beginning or ending of the observation period coincide with the beginning and ending of mathematics instruction as scheduled. As a result, two measures of the time involved in mathematics class were obtained. Available time represented the scheduled time period in which mathematics instruction was to take place. Actual time, on the other hand, represented the amount of time instruction actually occurred. In most cases, the amount of time observing coincided closely with the measure of available time.

As mentioned earlier, two students from each of the four categories, high prior achievement/high motivation, high prior achievement/low motivation, low prior achievement/high motivation, low prior achievement/low motivation were chosen as target students in each class. Live, in-class observation of these eight students in each class took place each day of the 10-day instructional period.

Generalizability of Observation

Generalizability of the observation technique was measured using the statistical methodology described by Cronbach, Gleser, Nanda and Rajaratnam (1972). To determine generalizability of

observation in a particular class, the observer of that class was paired with a second observer, the experimenter, twice during the duration of the study: once during the first week of instruction and once during the second week. Days for generalizability coding during the first week were randomly determined in as far as class meeting times and location would allow. Generalizability coding during the second week occurred for each class on the same day as the first week. The two observers coded classroom events simultaneously in the manner described earlier. Since it is very important when observers are coding simultaneously that they both observe exactly the same moment, an audio system was designed so that each of the two observers could hear a signal which would tell them when they were to code. The signal sounded every 30 seconds, and was delivered to each of the observers by way of earphones each wore.

The generalizability coefficients (ρ) for each observer, for each classroom behavior to be observed, with the exception of student absence, are given in Table 2.

The coefficients labeled with asterisks are thought to be artificially low or high due to the statistical procedure used to calculate ρ . These coefficients are based on few numbers of observations, because when reliability checks were done, few

Table 2
Generalizability Coefficients (ρ) for Each Classroom
Behavior for Each Observer

Behavior	Observer				
	1	2	3	4	5
Outlines objectives	.63*	1.00*	low*	1.00*	1.00*
Explains what to do next	.56	.81	.64	.14*	.90
Reviews/summarizes	.94	1.00*	1.00*	.45*	1.00*
Relates content to past/future	1.00*	low*	1.00*	1.00*	1.00*
Repeats question/explanation	low	low*	.68	1.00*	.38*
Emphasizes important point	.57*	.42*	low*	low*	low*
Other	low	.40	.92	.41	.86
Engaged	.74	.97	.92	.60	.95
Off-task	.74	.97	.91	.60	.95
Listening	.75	.66	.92	.57	.91
Individual	.87	.99	.99	1.00	.98
Small	1.00*	1.00*	1.00*	.28*	.99
Large	.87	.81	.98	.44*	.97
Games/puzzles	1.00*	1.00*	1.00*	1.00	1.00*
Competition	1.00*	1.00*	1.00*	.80	1.00*

instances of the behavior occurred. As was the situation for some observers for some behaviors, almost perfect agreement was obtained between observers that a particular behavior did not occur. However, the incidence of only one disagreement for a particular behavior in such a case was sufficient for the calculation of an artificially low ρ value. In the extreme case, perfect agreement that a behavior did not occur results in a ρ value which cannot be calculated, and hence was assigned a value of 1.00. In essence, then, if the proportion of zero frequencies for an observed behavior is high, ρ is not very meaningful. In Table 2, those ρ values labeled with asterisks represent those behaviors which observers agreed happened very infrequently. (See Appendix C for actual rater frequencies for each behavior, for each class, for each day.)

Student Pretesting

Student pretesting for both problem solving ability and attitude toward mathematics was conducted four days prior to the beginning of instruction. Pretesting was done during the time period which was regularly scheduled for mathematics class in each of the nine classrooms, and took approximately one hour to complete. All pretests were scored the following day in order that student test results might be made available to those teachers in treatments

one and two in time for the beginning of instruction. In addition, target students for observation were chosen on the basis of pretest results as indicated earlier.

Information Session

A brief information session was held the morning of the first day of instruction in which each teacher in treatments one or two was given the results of the pretests administered to his own students. Results were made available not in the form of raw scores, but rather whether each student in a particular class scored "high" or "low" for mathematics prior achievement, in terms of mathematics competency and problem solving, and motivation toward mathematics in relation to the remaining members of the class. A student's standing, (that is, "high" or "low"), on a pretest was determined by where he/she fell in relation to the class median for that pretest. Each teacher in treatment one or two was given prior achievement and motivation information for all his students; not just those students to be observed.

Student Posttesting

Student posttesting was conducted the day immediately following the conclusion of the 10-day instructional period. Three measures, (a) postachievement, (b) postattitude toward mathematics and (c) student perception of teacher clarity of presentation

were administered at that time. All posttesting was completed during regularly scheduled mathematics class time. Posttesting required approximately one hour.

Interviews were held with each of the teachers following the conclusion of the 10-day instructional period. Some were held during posttesting, others were held at times more convenient for teachers. The purpose of the interview was to ask questions with regard to aspects of the instructional process which might shed light on the interpretation of results gathered. In addition, teachers were allowed to say anything they wished with regard to any part of the study. A list of interview questions along with transcripts of each teacher interview are provided in Appendix H.

At the time of the teacher interview, teacher written lesson plans which had been recorded for the duration of the study, were collected. Descriptions of the training for lesson plan raters as well as typewritten copies of each teacher's written lesson plans can be found in Appendix D.

Summary

In summary, a two-week (10-day) mathematics topic was taught by nine elementary mathematics teachers at the beginning of the school year to nine fifth-grade classes. Teachers were asked to write all lesson plans they made for the mathematics topic.

Three experimental treatments were used with three teachers

in each. The three treatments were: (a) teachers provided with student aptitude information and motivation strategy information, (b) teachers provided with student aptitude information but no motivation strategy information and (c) teachers were provided with neither student aptitude information nor motivation strategy information. Student aptitude information given to teachers in treatments one and two was that obtained from student pretesting as well as fourth-grade mathematics competency scores made available by the school district.

Eight students in each class, chosen on the basis of pretest results, were observed each day of instruction for instances of student engagement in mathematics, student listening to teacher, and student involvement in certain organizational aspects of the classroom environment. In addition, each teacher was also observed for instances of particular verbal behaviors thought to be related to teacher clarity of presentation.

Student posttesting consisted of three measures: (a) a measure of postachievement based on the topic taught, (b) a measure of student perceived teacher clarity of presentation and (c) a measure of student postattitude toward mathematics. Teacher interviews were also conducted at the conclusion of the 10-day instructional period.

Chapter 4

Results

This chapter presents results of the study which directly bear on the questions presented at the end of chapter 2. In addition, results for secondary analyses are also presented.

So that results can be presented in an organized fashion, the following sequence will be followed. First, the specific questions to be examined are stated. Second, descriptive statistics are presented for those variables involved in the particular question and subsequent analyses. In addition, a brief explanation is given describing the data actually used in the analyses. Third, a rationale for the statistical procedure used, based on the descriptive data obtained, to examine the hypothesized relationship outlined in the question is provided. And fourth, the result of the statistical test used, in light of the question asked, is summarized.

Analysis for Question One

Question: How does aptitude information about individual students given to teachers affect the pre-instructional planning done by the teacher?

Hypothesis: Teachers who are given information about their students will evidence planning scores that differ from those of teachers who are not given such information.

The above hypothesis was tested by making comparisons between treatment group means. Means and standard deviations of planning scores for teachers in the three treatments (student information/motivation strategies; student information/no motivation strategies; no student information/no motivation strategies) are given in Table 3. Means and standard deviations are presented for both raw planning scores as well as proportions based on total number of planning statements made.

Table 3
Means and Standard Deviations for Planning
Scores in Each of Three Treatments

Treatments	$\bar{X}$ (raw)	SD	$\bar{X}$ (proportion)	SD
Student information/ motivation strategies	17.22	8.47	1.63	.44
Student information/ no motivation strategies	15.02	13.83	1.59	.57
No student information/ no motivation strategies	5.83	3.80	1.19	.34

Teacher preinstructional planning was assessed using written daily lesson plans which teachers were asked to complete while instruction was taking place.

All written lesson plans were coded for instances of teacher

statements in each of the following categories (categories are adapted from Zahorik, 1975; Peterson, Marx & Clark, 1978).

Objectives (Large Group)

Objectives (Individual or Small Group)

Content (Large Group)

Content (Individual or Small Group)

Activities (Large Group)

Activities (Individual or Small Group)

Instruction (Large Group)

Instruction (Individual or Small Group)

Organization

Materials (Large Group)

Materials (Individual or Small Group)

Diagnosis (Large Group)

Diagnosis (Individual or Small Group)

Use of Evaluation Procedures (Large Group)

Use of Evaluation Procedures (Individual or Small Group)

Alternative Procedures (Large Group)

Alternative Procedures (Individual or Small Group)

It is expected the effective planner frequently considers student interests and aptitudes in the utilization of instructional procedures from both whole class and individual student perspectives. Also, it is expected the effective planner frequently considers

individual rather than whole class needs and interests. As such, scaling of planning categories is accomplished at two levels: (a) between categories and (b) within categories. Separate categories are first scaled as to their relative importance in regard to the determination of an effective planner, in relation to the hypotheses of the study. Subcategories are then scaled similarly. For example, the category Diagnosis is expected to be more representative of effective planning than the category Materials. Hence, teacher planning statements which reflect diagnosis are given higher scores than statements reflecting what materials should be used. However, statements labeled as Materials (Individual or Small Group) are given higher scores than statements labeled Materials (Large Group).

Planning categories and points given to each statement rated as falling into that category are given below:

1 Point

Content (Large Group)
 Activity (Large Group)
 Instruction (Large Group)
 Materials (Large Group)
 Organization

2 Points

Content (Ind/Sm Group)
 Activity (Ind/Sm Group)
 Instruction (Ind/Sm Group)
 Material (Ind/Sm Group)

3 Points

Objectives (Large Group)

Diagnosis (Large Group)

Evaluation (Large Group)

Alternative Proce-

dure (Large Group)

4 Points

Objectives (Ind/Sm Group)

Diagnosis (Ind/Sm Group)

Evaluation (Ind/Sm Group)

Alternative Procedure (Ind/Sm Group)

Suppose, for example, a teacher's written plan for the day showed the following distribution of statements for the above categories:

<u>Category</u>	<u>Frequency</u>
Activity (Large Group)	3
Instruction (Large Group)	4
Materials (Large Group)	2
Diagnosis (Ind/Sm Group)	1

That teacher's raw planning score for the day would be computed as follows:

$$(3 \times 1) + (4 \times 1) + (2 \times 1) + (1 \times 4) = 13$$

Effective planners are defined as having higher raw planning scores. However, a problem exists in that not all teachers are identical in the total number of planning statements they write. Consequently, an alternative method of calculating the teacher's planning score is dividing the raw planning score by the total number of planning statements made. The number which results

takes into account planning differences in terms of total number of written statements, and so is a more accurate reflection of planning quality. Planning category definitions can be found in Appendix B.

Data in Table 3 indicate the means of the three treatment groups with respect to planning scores are in the predicted direction. Teachers who were given information about their students in addition to information about motivation strategies useful in the classroom had higher teacher planning scores than either teachers who were given only information about their students or teachers who were given no information; either about students or motivation strategies. Also, teachers who were given only student aptitude information had higher planning scores than those teachers who were given no information at all.

Since a planning score could be obtained for each teacher for each day instruction took place, a repeated measures analysis of variance procedure was used to test whether the differences in raw planning score means indicated in Table 3 were significant. Results of the overall F -test are given in Table 4.

Using the mean square error (811.95) generated by the test, planned, pairwise comparisons were calculated among the three treatment groups and the resultant confidence intervals are given in Table 5. In relation to the hypothesis of question one, the comparison between treatment groups two (student information/no motivation strategies) and three (no student information/no motivation

Table 4
Summary of Analysis of Variance for
Teacher Planning (Raw scores)

Source	<u>df</u>	<u>SS</u>	<u>MS</u>	η^2	<u>F</u>
Treatment	2	2,187.54	1,093.77	.31	1.35
Error	6	4,871.70	811.95		
Day	9	551.34	61.26	.23	2.23*
Day X Treatment	18	410.41	22.80	.17	.83
Error	54	1,486.30	27.52		

* $p \leq .05$

Table 5
Planned, Pairwise Comparisons Among Three
Treatment Groups for Raw Planning Scores^a

Comparison	Confidence interval
$\psi_1 = \mu_2 - \mu_3$	$-15.39 \leq \psi_1 \leq 33.76$
$\psi_2 = \mu_1 - \mu_2$	$-22.37 \leq \psi_2 \leq 26.77$
$\psi_3 = \mu_1 - \mu_3$	$-13.19 \leq \psi_3 \leq 35.96$

^aMean subscripts indicate treatment: 1(Student information/motivation strategies), 2(Student information/no motivation strategies), 3(No student information/no motivation strategies).

strategies) indicates no significant effect of student aptitude information on the quality of teacher written planning.

In general, scores based on proportions are not normally distributed. Hence, treatment group differences in planning based on proportional scores were examined using the Kruskal-Wallis procedure. Consistent with results reported using raw scores, no significant differences among treatment groups were found

$$(H = 3.29, \chi^2_{2;.95} = 5.99).$$

Analysis for Question Two

Question: Do teachers who are given motivation strategies to use with individual students or groups of students, plan differently than those who are not given such strategies?

Hypothesis: Teachers who are given motivation strategies to use with individual students or small groups of students will evidence planning scores which differ from those of teachers not given such strategies.

A planned comparison between treatment groups one (student information/motivation strategies) and two (student information/no motivation strategies) was used to test the hypothesis given above. Results of the comparison indicate that planning quality of teachers given motivation strategies was not significantly different from planning quality of teachers who were not given such strategies (see Table 5).

Analysis for Question Three

Question: Is quality of preinstructional planning related to how motivation strategies are used in the classroom?

Hypothesis: Teacher planning scores will predict motivation strategy use scores.

Table 6 shows teacher planning and observed motivation strategy use scores for each teacher for each day of the study.

Motivation strategy use scores, as described in Appendix B, were obtained by dividing the total number of instances motivation strategies (small groups, games/puzzles, competition) were observed in the classroom each day, by the total number of moments observed that same day.

Rather than calculate Pearson's correlation coefficient directly from the planning and motivation strategy usage scores for each teacher for each day, it was felt that to minimize the possibility of a spurious relationship due to the day effect, z-scores should be obtained for each teacher's planning and observed motivation strategy use scores for each day. One should obtain z-scores for planning and z-scores for observed motivation strategy usage and then add them together separately in order that two overall z-scores

Table 6
Planning and Observed Motivation Strategy Use
Scores for Each Teacher by Day

Teacher/variable	Day										$\bar{X}$	SD
	1	2	3	4	5	6	7	8	9	10		
Teacher 1												
Planning	1.40	1.50	1.40	1.50	1.33	1.31	1.69	1.17	1.33	1.33	1.42	.14
Motivation strategy use	0.00	0.00	0.00	0.00	0.20	0.30	0.00	0.00	0.00	0.00	0.05	.11
Teacher 2												
Planning	1.29	1.31	1.27	1.47	1.00	1.89	1.00	2.06	2.38	2.24	1.59	.51
Motivation strategy use	0.00	0.00	0.00	0.00	1.69	0.09	0.20	0.09	0.22	0.19	0.23	.51
Teacher 3												
Planning	1.41	1.38	1.53	2.34	2.17	1.38	1.46	1.57	1.71	1.60	1.72	.37
Motivation strategy use	0.00	0.00	0.40	0.39	1.09	0.00	0.00	0.00	0.00	0.00	0.19	.36
Teacher 4												
Planning	1.00	1.00	1.13	1.40	1.22	1.44	1.14	1.46	1.00	1.29	1.21	.18
Motivation strategy use	0.26	0.00	0.36	1.46	0.18	0.94	0.13	0.63	1.23	1.22	0.64	.53
Teacher 5												
Planning	1.62	1.23	1.56	2.50	2.26	2.48	2.57	2.33	2.06	2.06	2.07	.46
Motivation strategy use	0.00	0.00	0.00	0.19	1.26	0.10	0.13	0.13	0.13	0.08	0.20	.38
Teacher 6												
Planning	1.44	1.00	1.00	1.00	1.20	1.25	1.00	1.00	1.00	1.00	1.09	.16
Motivation strategy use	0.00	0.00	0.00	0.00	0.30	0.30	0.30	0.02	0.01	0.00	0.00	.01
Teacher 7												
Planning	1.46	1.79	1.35	2.60	2.10	1.89	2.27	1.97	2.37	2.10	1.96	.37
Motivation strategy use	0.51	0.53	0.30	0.05	0.90	0.00	0.00	0.30	0.23	0.47	0.33	.34

Table 6 (continued)

Teacher/variable	Day										$\bar{X}$	SD
	1	2	3	4	5	6	7	8	9	10		
Teacher 3												
Planning	0.00	1.00	1.00	1.00	2.00	1.00	1.50	1.00	1.14	1.00	1.06	.50
Motivation strategy use	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.10	1.07	0.70	0.19	.38
Teacher 9												
Planning	1.00	1.00	1.00	1.30	1.00	1.00	1.00	1.00	1.00	1.33	1.11	.26
Motivation strategy use	0.00	0.00	0.00	0.00	1.32	0.00	0.40	0.37	0.73	0.77	0.41	.58
$\bar{X}$ (Planning)	1.18	1.30	1.25	1.76	1.59	1.52	1.52	1.31	1.55	1.55		
$\bar{X}$ (Motivation)	0.09	0.06	0.09	0.23	0.79	0.16	0.09	0.24	0.40	0.38		
SD (Planning)	.49	.35	.23	.64	.53	.49	.58	.51	.54	.47		
SD (Motivation)	.18	.18	.17	.48	.72	.31	.14	.30	.48	.44		

might be obtained for each teacher: one for planning and one for observed motivation strategy use. It was these overall z-scores which were used to obtain a correlation coefficient between teacher planning and observed motivation strategy use. The resultant correlation coefficient ($r = -.03$) indicated no significant relationship between the quality of teacher planning and observed motivation strategy use in the classroom.

Analysis of Question Four

Question: How is the quality of teacher preinstructional planning done by a teacher related to both observed and student perceived teacher clarity of instruction?

Hypothesis: Teacher planning scores will predict observed and student perceived teacher clarity scores.

The analysis for the above question will be presented in two parts: (a) the relationship of teacher preinstructional planning to observed teacher clarity of presentation and (b) the relationship of teacher preinstructional planning to student perceived teacher clarity of presentation.

Observed teacher clarity is assessed using live classroom observation. With the exception of the category "other," each category of teacher behavior used to assess teacher clarity is

given equal weight in obtaining an overall observed teacher clarity score for each teacher. Each observed instance of one of the teacher behaviors, outlining objectives, explaining what to do next, review/summarize, relating content, repeating question or explanation, emphasizing important points is counted twice compared to the category "other."

As an example of scoring, suppose a teacher was observed having the following distribution of verbal behaviors:

<u>Category</u>	<u>Frequency</u>
Outlines	2
Reviews/Summarizes	1
Repeats Question/Explanation	1
Other	15

The teacher's raw observed clarity score would be computed as follows:

$$(2 \times 2) + (1 \times 2) + (1 \times 2) + (15 \times 1) = 23$$

However, since all classes were not identical in length, a proportion of behavior occurrence is calculated by dividing the teacher's raw score by the total number of cycles observed that day. As such, class length is adjusted for. Descriptions of teacher behavior variables are given in Appendix C.

Table 7 presents observed teacher clarity scores (proportions)

Table 7
Observed Teacher Clarity Scores for
Each Teacher by Day

Teacher	Day										$\bar{X}$	SD
	1	2	3	4	5	6	7	8	9	10		
1	1.23	1.16	1.40	1.15	1.11	1.18	1.11	1.13	0.95	0.88	1.13	.14
2	0.86	0.50	0.61	0.74	0.39	0.74	0.95	0.68	0.92	0.57	0.70	.18
3	0.61	0.78	0.65	0.57	0.81	0.85	0.89	0.78	0.55	0.86	0.73	.13
4	1.49	0.96	1.01	0.43	1.11	0.89	0.74	1.03	0.72	0.78	0.92	.28
5	0.98	0.78	0.83	0.85	0.58	0.88	0.83	0.66	0.71	0.76	0.78	.11
6	0.55	0.52	0.31	0.57	0.43	0.43	0.19	0.43	0.36	0.54	0.43	.12
7	1.26	0.80	0.58	0.70	0.78	0.75	0.63	0.46	0.88	0.81	0.76	.21
8	1.28	0.76	0.68	0.58	0.68	0.50	0.55	0.65	0.58	0.88	0.71	.23
9	1.14	0.56	0.50	0.64	0.24	0.25	0.50	0.69	0.46	0.55	0.55	.25
$\bar{X}$	1.04	.76	.73	.69	.68	.72	.71	.72	.68	.74		
SD	.32	.22	.32	.21	.31	.28	.28	.23	.21	.14		

for each teacher for each day of instruction.

The procedure used to examine the relationship between teacher preinstructional planning and observed teacher clarity of presentation was identical with that described for the analysis of question three. Overall z-scores were obtained for each teacher for the variables teacher planning and observed teacher clarity of presentation. The resulting z-scores were then correlated. A non-significant value of $r = .31$ ($p \leq .22$) was found between quality of teacher planning and observed teacher clarity of presentation.

With regard to the second part of question four, Table 8 gives the means and standard deviations for teacher planning and student perceived clarity scores for each class.

In this case, since only one perceived clarity score was obtained for each student, mean planning scores for teachers were correlated with mean student perceived clarity scores for respective teachers' classes. The resultant r value, $.54$ ($p \leq .07$) approached significance at the .05 level. The correlation is indicative of a positive relationship between quality of teacher preinstructional planning and student perceived clarity of instruction.

Table 8
Means and Standard Deviations for Teacher
Planning and Perceived Clarity by Class

Class	Teacher planning		Perceived clarity	
	$\bar{X}$	SD	$\bar{X}$	SD
1	1.42	.15	112.10	18.30
2	1.59	.51	121.94	11.45
3	1.72	.37	117.47	15.07
4	1.21	.18	116.85	15.84
5	2.07	.46	116.78	9.49
6	1.09	.16	119.19	10.19
7	1.96	.37	123.05	15.69
8	1.06	.50	111.84	8.01
9	1.11	.26	110.31	5.98

Analysis for Question Five

Question: Is the use of motivation strategies in the classroom related to the amount of student engaged time?

Hypothesis: Motivation strategy use scores predict engaged time scores.

Measures of engaged time as well as the use of motivation strategies in the classroom were obtained for each observed student, for each day the student was observed. As a result, 10 pairs of scores, each pair consisting of one score for motivation strategy use and one for student engaged time, were obtained for each of 64 observed students; only 64 students were used in the analysis since no instances of motivation strategy use were observed for seven students. The first step of the analysis entailed the computation of Kendall's τ for each student. The rationale for using τ instead of Pearson's r lies in the rapidity with which the distribution of τ approaches normality related to r . Consequently, 10 pairs of scores were considered more than sufficient in computing a separate τ for each student. A range of $-.67$ to $+.58$ with $\bar{X}_{\tau} = -.03$ was found for all τ values computed.

The second step in the analysis required the testing of the mean in relation to the hypothesis, $H_0: \mu_{\tau} = 0$. A one sample t -test was chosen in this case. The resultant t -value ($t = -.66$) was not significant. The result indicates no significant relationship between the use of motivation strategies in the classroom and student engaged time.

Analysis for Question Six

Question: How is teacher clarity of presentation related to student engaged time?

Hypothesis: Observed and student perceived clarity scores will predict engaged time scores.

The reader is referred to Table 8 for the descriptive data for the variable observed teacher clarity.

Table 9 gives student engaged time scores for each teacher for each day of instruction. Scores for student engaged time, as described in Appendix B, were proportions of total observed moments the target student was engaged.

The procedure used to examine the relationship between observed teacher clarity and student engaged time was identical to that used in questions three and four. Overall z-scores were obtained for each teacher for the variables observed teacher clarity of presentation and student engaged time. The resulting z-scores were then correlated. An r value of .63 ($p \leq .04$) was found. The r value obtained suggests a significant positive relationship between observed teacher clarity of presentation and student engaged time.

With regard to the second part of the hypothesis, Table 10 presents the means and standard deviations for the variables student perceived clarity of instruction and student engaged time. Means and standard deviations are only calculated for observed students in this analysis since only those students can provide estimates of student engaged time.

The analysis chosen in this case was a partial correlation.

Table 9
Student Engaged Time Scores for
Each Teacher by Day

Teacher	Day										$\bar{X}$	SD
	1	2	3	4	5	6	7	8	9	10		
1	.96	.99	.91	.79	.85	.89	.77	1.00	.93	.95	.90	.08
2	.77	.67	.76	.70	.71	.76	.76	.81	.91	.79	.76	.07
3	.88	.86	.92	.78	.86	.91	.88	.96	.88	.78	.87	.06
4	.99	.95	.81	.79	.83	.89	.94	.82	.89	.90	.88	.07
5	.88	.79	.88	.86	.85	.90	.73	.66	.78	.92	.82	.08
6	.73	.71	.75	.89	.86	.93	.84	.86	.76	.88	.82	.08
7	.78	.66	.81	.84	.91	.86	.64	.84	.73	.81	.79	.09
8	.89	.91	.76	.97	.88	.90	.79	.78	.84	.90	.86	.07
9	.78	.74	.71	.71	.81	.81	.49	.83	.65	.64	.72	.10
$\bar{X}$	.85	.81	.81	.81	.84	.87	.76	.84	.82	.84		
SD	.09	.12	.07	.09	.06	.05	.13	.10	.09	.10		

Table 10
Means and Standard Deviations for Student Engaged Time
and Student Perceived Clarity by Class

Class	Engaged time		Perceived clarity	
	$\bar{X}$	SD	$\bar{X}$	SD
1	.90	.05	101.27	24.01
2	.77	.07	122.98	14.98
3	.87	.10	124.75	16.98
4	.88	.05	113.00	21.31
5	.82	.07	115.71	7.85
6	.82	.10	120.84	13.21
7	.79	.08	113.51	15.09
8	.86	.04	114.77	5.97
9	.69	.19	110.30	5.98

procedure in which observed teacher clarity was the variable partialled out of the relationship between perceived clarity and engaged time. It was felt that observed clarity represented a "true" estimate of teacher clarity of presentation and hence should be partialled out. Due to the fact that only one observed clarity

score was obtained per class, the calculation of a pooled within class correlation coefficient for the relationship between perceived clarity and student engaged time had the effect of "partialing" out observed teacher clarity without any further work. The pooled correlation coefficient obtained was $r = .31$. A t -test was then applied to test the significance of the coefficient. A t -test value of 2.55 ($p \leq .05$) was obtained. The result indicates that there was a significant positive relationship between student perceived teacher clarity of presentation and student engaged time.

Analyses of Secondary Questions

Two secondary questions were also examined in this investigation: (a) the relationship of student engaged time to student achievement and (b) the effect of treatment group on student achievement. To test the existence of a relationship between engaged time and achievement a partial correlation procedure was employed in which prior achievement (in terms of both mathematics competency and mathematical problem solving ability) was partialled out of the relationship between student engaged time and postachievement. The resulting partial correlation coefficient ($r = .27$) was found to be significant ($t = 2.20, p \leq .05$). Zero-order correlations for the four variables are presented in Table 11.

Table 11

Pooled Within Zero-Order Correlations Among the Variables
 Prior Achievement (Competency, Problem Solving),
 Student Engaged Time and Postachievement

Variable	Mathematics competency	Problem solving	Engaged time	Postachievement
Mathematics competency	1.00	.76*	.48*	.75*
Problem solving		1.00	.41*	.77*
Engaged time			1.00	.52*
Post-achievement				1.00

* $p \leq .01$

With regard to the second question, analysis of covariance (using both mathematics competency and problem solving ability as covariates) was used to obtain the adjusted treatment means as well as the mean square error. It should be noted here that classes four and nine were not included in this analysis. During the course of instruction, the teacher of class four indicated that to try and cover all the material he was asked to in the 10-day instructional period would result in undue pressure being placed upon his students. At no time did the experimenter believe this decision to be a result

of information about students given to the teacher prior to the beginning of the study. Class nine presented different problems in that first, it was a split grade (half fourth-grade/half fifth-grade), which resulted in considerable difficulties with classroom organization and the like, and second, severe discipline problems were evident from the beginning. It became obvious as instruction proceeded that little content would be covered. When instruction for the 10 days had concluded, both classes had covered only one activity out of five.

As a result, in carefully considering the circumstances surrounding the two classes, it was the experimenter's opinion that for these classes postachievement would be influenced most by lack of content covered rather than by experimental treatments.

For the remaining seven classes, adjusted treatment means for student achievement are: 26.29 (treatment one/all information) 21.75 (treatment two/only student information), 17.85 (treatment three/no information). Table 12 presents the results of the analysis of covariance.

Planned, pairwise comparisons among the three treatments and their resulting confidence intervals are shown in Table 13. The mean square error used in the calculation of the planned comparisons was 48.27.

As can be seen, students of teachers in treatments one and two (student information/motivation strategies; student information/no

Table 12

Analysis of Covariance for Postachievement with Mathematics
Competency and Problem Solving Ability as Covariates

Source	Adjusted df	Adjusted SS	Adjusted MS	η^2	F
Covariates	2	6654.47	3327.24	.43	68.93*
Treatments	2	1541.20	770.60	.18	15.96*
Error	150	7240.72	48.27		
Total	154	8781.92			

* $p \leq .001$

Table 13

Planned, Pairwise Comparisons Among Three Treatment
Groups for Postachievement (Adjusted for
Competency and Problem Solving Ability)^a

Comparison	Confidence interval
$\psi_1 = \mu_2 - \mu_3$	$.74 \leq \psi_1 \leq 7.07$
$\psi_2 = \mu_1 - \mu_2$	$.93 \leq \psi_2 \leq 8.14$
$\psi_3 = \mu_1 - \mu_3$	$5.03 \leq \psi_3 \leq 11.85$

^aMean subscripts indicate treatment: 1(Student information/
motivation strategies), 2(Student information/no motivation
strategies), 3(No student information/no motivation strategies).

motivation strategies) achieved significantly better than students of teachers in treatment three (no student information/no motivation strategies). In addition, students of teachers who were given both student information and motivation strategies achieved significantly better than students of teachers who were given only student information.¹

Summary of Results

In summary, this chapter has presented the specific statistical analyses used to examine the six questions put forward in chapter 2, as well as analyses for two secondary questions. Briefly, the results which bear directly upon those questions are:

1. Teachers who were given neither student aptitude information no motivation strategy information did not plan significantly differently than those who were given such information.

2. Teachers who were given motivation strategy information as well as student aptitude information did not plan significantly differently than those who were only given student aptitude information.

3. There was no significant relationship between quality of teacher planning and observed motivation strategy use in the classroom.

¹ A later analysis which included classes four and nine indicated similar findings; the only exception being a non-significant difference between treatments one and two (see Appendix J).

4. There was no significant relationship between the quality of teacher planning and either observed or student perceived clarity of presentation.

5. There was no significant relationship between the use of motivation strategies in the classroom and student engaged time.

6. There were significant, positive correlations between both observed teacher clarity as well as student perceived teacher clarity, and student engaged time.

7. There was a significant, positive correlation between student engaged time and student achievement.

8. There was a significant effect of treatment group on student achievement. Students of teachers who were given both student information and motivation strategy information achieved more than students of teachers who were given only student information. In addition, students of teachers who were given only student information achieved better than students of teachers given no information.

Chapter 5

Discussion

This chapter reviews and discusses findings presented in chapter 4 in relation to the model of teacher preinstructional planning proposed. In addition, limitations and conclusions of the study are also examined.

Discussion of Analysis for Questions One and Two

Question One: How does aptitude information about individual students given to teachers affect the preinstructional planning done by the teacher?

Result: Since mean planning scores were not significantly different among the three treatment groups, it was inferred that teachers who were given student aptitude information did not plan significantly differently than those who were not given such information.

Question Two: Do teachers who are given motivation strategies to use with individual students or small groups of students, plan differently than those who are not given such strategies?

Result: Again, since group mean planning scores did not differ, teachers who were given motivation strategy information did not plan

significantly differently than those who were not.

The lack of significant differences among groups is not too surprising when one considers that written preinstructional planning done by these teachers has most likely taken on predictable patterns. It is probable that written planning done for the study was not much different in format than written planning done normally. In this regard, then, the types and content of written planning done for the study were more likely dependent on teachers' prior planning experience rather than on the aptitude information given them about their students. Indeed, teachers indicated at the conclusion of the study that written planning done during the two weeks did not differ greatly from written planning done normally. Such a conclusion is consistent with Yinger's (1978) notion of "teaching routines" which are used to "reduce the complexity of the teaching environment." It seems natural such teaching routines would be well established in an experienced teacher and would manifest themselves in written planning.

A logical next step is to suggest that not only does a teacher develop teaching routines, but a teacher will likely develop what Yinger calls "executive planning routines." Such planning

routines would not allow for much variety in planning format or content. Morine's (1976) finding that teachers were generally unable to formulate, on their own, different teaching strategies and evidence reported by McCutcheon (1979) suggesting teachers rarely consider alternative procedures in written planning, lend additional support.

The fact that teachers who were given motivation strategy information did not differ in their planning from teachers who were not given such information may be again an indication of the fixed nature of written plans.

Even though the use of heterogeneous small groups in the classroom was a primary aspect of motivation strategy information given to three teachers, there were not significantly more planning statements focusing on the individual or small group. This is not to say that such information was not used. A more detailed analysis seems to indicate teachers given information about small groups did use them in the classroom (see Appendix J).

Discussion of Analysis for Question Three

Question Three: Is quality of preinstructional planning related to how motivation strategies are used in the classroom?

Result: As indicated by the non-significant correlation

obtained between planning and observed motivation strategy use scores, there is no significant relationship between quality of preinstructional planning and observed motivation strategy use in the classroom.

The correlation ($r = -.03$) obtained between quality of teacher planning and observed motivation strategy use suggests teachers who plan more with individuals and small groups of students in mind do not necessarily use motivation strategies more in the classroom. Such a finding should be considered carefully, however, since quality of planning was determined primarily by the number of planning statements focusing on individuals or small groups of students. Planning statements were not categorized as to whether they dealt with games/puzzles or competition. Such references, if they occurred, would have been coded as student activities or materials. Planning statements dealing with large group activities or materials were positively related to the use of both games/puzzles and competition (activities [lg]: $r = .64$, $r = .61$, $p \leq .001$; materials [lg]: $r = .58$, $r = .57$, $p \leq .001$) whereas statements making reference to small group activities or materials were not related to either (activities [sm]: $r = -.02$, $r = -.02$; materials [sm]: $r = -.10$, $r = -.12$). It seems that

teachers were thinking of using games/puzzles or competition with large groups rather than small groups a majority of the time. Such a conclusion is not hard to understand considering the limited nature of the time available to teach the topic. Teacher time spent organizing such activities would be minimized if all students participated.

There was a positive, significant relationship ($\underline{r} = .20$, $p \leq .05$) between the total percentage of written planning statements making reference to small groups or individuals and the use of small groups in the classroom. One probably would predict a higher association. Two interpretations can be advanced. First, when planning statements were coded, no attempt was made to separate statements focusing on individuals from statements focusing on small groups. Consequently, statements dealing with individuals may have been prevalent. Support for this hypothesis is found in the positive association ($\underline{r} = .42$, $p \leq .001$) between the percentage of small group/individual planning statements and use of individual grouping. A second explanation may be found in teachers' beliefs about classroom groups.

It seems probable different definitions exist for the word "group" in teachers' vocabulary. One teacher had a large percentage of small group planning statements; however, in that class,

relatively few instances of small groups in the classroom were observed. What this seems to indicate is that the teacher was aware of specific "groups," ability or otherwise, but did not use the information to develop actual student groups in the classroom; at least not so they could be observed. If this was generally the case across all teachers, it is not surprising that a small, significant relationship was found between planning statements dealing with individuals or small groups and observed small grouping in the classroom.

An explanation for the opposite phenomenon that is, teachers using small groups in class but having few planning references to small groups, may lie in McCutcheon's (1979) finding that teachers generally use written planning as a memory jogger. In this instance, the teacher may "know" what he or she is going to do but not write it down.

Discussion of Analyses for Question Four

Question Four: How is the quality of teacher preinstructional planning related to both observed and student perceived teacher clarity of presentation?

Result: No significant relationship between the quality of teacher planning and observed or perceived teacher clarity of presentation was

inferred from the non-significant correlation between planning and observed or perceived clarity scores.

As indicated in chapter 4, quality of teacher planning was positively related to both observed and student perceived teacher clarity of presentation. However, neither relationship was significant. The finding that teacher preinstructional planning, in this study, is not significantly related to observed teacher clarity, was most likely due to the fact that a majority of planning statements did not refer to specific verbal statements made by teachers in the classroom. Using the coding procedure outlined in Appendix B, references to verbal statements, had they occurred, would have been coded as instructions. Instructional planning statements accounted for approximately 16 percent of total planning statements made (see Appendix D). However, instructional planning statements generally included specific non-verbal activities or procedures (for example, writing on blackboard, using overhead) the teacher was going to use. As a result, verbal statements the teacher made in class were usually not reflected in written planning. The finding that instructional planning statements, either small or large group, were not significantly correlated with any verbal teacher behavior supports this conclusion.

In addition, it might be that planning statements dealing with objectives, for example, may be only for the teacher's benefit and might not necessarily generate teacher verbal statements in class also dealing with objectives. The non-significant association between planning statements dealing with either large or small group objectives and teacher verbal behaviors coded as outlining ($\underline{r} = .21, p \leq .30$ [lg]: $\underline{r} = -.03, p \leq .47$ [sm]) seems to indicate as much. Other teacher verbal behaviors such as repeating a question or explanation when students seem not to understand probably would not be foreseen by the teacher and hence would not show up in written preinstructional planning.

Teachers' verbal classroom behaviors may follow a pattern much like their planning. In other words, based on previous classroom experience, certain teacher verbal classroom behaviors may be seen as generalizable from one day to the next; assuming subject matter, students, and the like remain constant. In the case of highly specific verbal behaviors like those examined in this study, generalizability seems likely. For example, Table 14 shows the number of observed instances of the teacher verbal behavior "emphasizing important points" for each teacher for each day of observation.

Table 14
 Observed Instances of the Teacher Verbal Behavior
 "Emphasizing Important Points" by Teacher

Teacher	Day									
	1	2	3	4	5	6	7	8	9	10
1	1	4	4	1	2	0	1	0	0	1
2	2	0	3	1	0	3	3	2	3	1
3	0	0	1	1	0	1	0	1	0	0
4	0	0	0	0	0	0	0	0	0	1
5	0	2	0	1	0	0	0	0	0	0
6	0	0	0	0	0	0	1	0	0	0
7	2	0	0	0	0	0	0	0	3	0
8	3	1	2	0	0	0	0	0	0	0
9	2	0	0	0	0	0	0	0	0	0

As can be seen, there are no dramatic fluctuations in frequency of occurrence for the verbal behavior for any teacher. In fact, the behavior seems relatively stable across days for all teachers. The notion of generalizability of teacher verbal behavior is consistent with Yinger's (1978) conception of

"instructional routines" which describe the ways in which teachers actually behave while teaching the content. As Yinger states, "Instructional routines are the methods and procedures the teacher established to carry out specific instructional moves. These routines were, in effect, strategies or styles of teaching that were developed over time, and they occurred in established configurations and sequences. The teacher used instructional routines for questioning, monitoring, giving instructions, etc." (pp. 16-17).

In sum, the lack of a significant relationship between quality of teacher planning and observed teacher clarity might possibly be explained in two ways: (a) the relatively few number of specific references to actual teacher verbal classroom behaviors in preinstructional written planning and (b) the notion of routinization of teacher verbal classroom behavior based on previous experience, independent of teacher planning.

The finding that quality of teacher planning is not significantly related to student perceived teacher clarity of presentation is reasonable considering the non-significant relationship of planning with observed teacher clarity of presentation. It seems likely that a student's perception of how clear the teacher's presentation is would be based on a variety of characteristics not necessarily reflected in written planning done by the teacher. The

significant, positive correlation between student preinstructional attitude and student perceived clarity ($r = .34$, $p \leq .001$ for all students; $r = .38$, $p \leq .01$ for observed students) indicates as much. In addition, student mathematics competency is also significantly related to student perceived clarity ($r = .39$, $p \leq .001$ for all students; $r = .42$, $p \leq .01$ for observed students). What this suggests is that a student's perception of teacher clarity is related to that student's attitude toward as well as prior success in the subject. These findings are consistent with Stayrook, Corno and Winne (1978) who found student perceptions of certain teacher behaviors mediated to a degree by student aptitudes.

In sum, this study found no significant relationship between the quality of teacher planning and either observed or student perceived teacher clarity of presentation. Such findings are thought to be due in part to (a) lack of teacher verbal classroom statements being reflected in written planning, (b) the possibility of teacher verbal classroom behavior patterns and (c) the mediating effect of student aptitudes on student perceptions.

Discussion of Analysis for Question Five

Question Five: Is the use of motivation strategies in the classroom related to the amount of student

engaged time?

Result: The non-significant association between motivation strategy use scores and engaged time indicated no significant relationship between the use of motivation strategies in the classroom and student engaged time.

The result indicates no significant relationship between the use of motivation strategies in the classroom and student engaged time. That is, motivation strategy use as defined in this study seems not to predict the amount of time students are engaged.

Within group pooled correlations indicate the non-significant value of r is due primarily to the non-significant relationship of small group use with student engaged time ($r = .04$). Use of games/puzzles and competition were both significantly related to student engaged time ($r = .27, p \leq .05$; $r = .25, p \leq .05$ respectively). The result is not unexpected since competition occurred primarily when games were being used.

The finding that students were not any more or less engaged when in small groups needs to be clarified. Although students might be found in small groups, there is no indication from the

data gathered in this study how much interaction was occurring among students in a small group. If students were mainly working individually in the small group, it is doubtful the small group effect would overcome the individual student's tendency to be engaged or off-task at any particular time. Evidence in support of the above suggestion can be found in the positive relationship ($r = .22$, $p \leq .10$) between students in large groups and engaged time as well as the significant, negative relationship ($r = -.31$, $p \leq .05$) between students working individually and engaged time. It seems plausible that students working individually might be more subject to certain types of off-task waiting behavior. Some students finish early and are left with nothing to do. Others are confused and must wait for the teacher to come around and help. The positive relationship between large grouping and student engaged time can be attributed to the notion that large grouping infers lecture. Large grouping was correlated highly ($r = .55$, $p \leq .01$) with students listening to the teacher. It seems natural that a majority of teacher talk would occur during large group situations.

Discussion of Analysis for Question Six

Question Six: How is teacher clarity of presentation related to student engaged time?

Result: Correlations obtained between both observed and perceived clarity scores and engaged time suggested significant, positive relationships between both observed teacher clarity as well as student perceived teacher clarity, and student engaged time.

As indicated, both observed and student perceived teacher clarity of presentation (partialing out observed teacher clarity) were significantly, positively related to student engaged time ($r = .63, p \leq .04$; $r = .31, p \leq .05$ respectively).

The notion is intuitively appealing that students of a teacher whose classroom presentation is clear, in terms of outlining objectives, explaining what to do next, reviewing and summarizing, relating present content to past and/or future content, repeating questions or explanations when students seem not to understand, and emphasizing important points, will spend more time actually working on the subject matter. As explained earlier, the above teacher verbal behaviors were chosen to represent statements reflecting teacher clarity of presentation not only on the basis of previous work done, but also because it was believed the behaviors chosen would be particularly important in the clear presentation of mathematics content.

It should be noted that a causal relationship between teacher clarity as defined earlier and engaged time is not necessarily warranted from the data. Alternative interpretations are possible. For example, teachers who exhibit more verbal behaviors representative of teacher clarity may also talk more in total. In such an instance, it might be expected that classrooms in which total teacher talk is high would evidence higher engagement as well.

However, in one respect, several of the teacher behaviors chosen here to represent teacher clarity of presentation could also be thought of as behaviors representative of lesson structuring. For example, behaviors such as outlining objectives, reviewing and/or summarizing, explaining what to do next and relating present content to past and/or future content could all be considered examples of lesson structuring behaviors particularly valuable in mathematics instruction. The finding that verbal structuring is positively related to student achievement is well documented (Fisher et al., 1978; Program on Teaching Effectiveness SCRDT, 1976; Wright & Nuthall, 1970). The possibility that teacher verbal structuring may be positively related to student engaged time has been examined by Fisher et al. (1978). Their variable "structure/direct" was defined as "...presentation of procedure, either a description of the content to be covered or specific directions on what to do." The occurrence of structure/direct was

positively related ($r = .29$) to the amount of student engaged time in fifth-grade mathematics classes. It was also found that the amount of planned explanation the teacher gave was positively related ($r = .45$) to student engaged time.

As inferred in the discussion of question 5, most verbal structuring done by the teacher probably takes place during large group instruction. In such cases, lecturing is the primary means of instruction in which all or most students' attention is focused on the teacher. It is natural to expect rates of engagement as measured by this study to be quite high under such circumstances. The percentage of engagement calculated for each observed student includes all observed instances of engagement, whether they occur while the teacher is verbally structuring or while students are working individually and the teacher is walking around the room not saying anything. However, if for example the teacher has not been clear in his or her directions about what to do, or if the teacher has not indicated what students are doing today is similar to what they did yesterday, it might be expected that students would exhibit some confusion, and hence, more off-task behavior. To the extent, then, that teachers verbally structure the day's lesson in terms of reviewing, outlining objectives, explaining what to do next, and the like, one would

expect less confusion and more engaged behavior.

The hypothesis that students who perceive the teacher's presentation as clear will exhibit greater student engaged time, was supported by the data. The result was obtained by partialing out the effect of observed teacher clarity, since observed teacher clarity was thought to be a "true" estimate of presentation clarity as defined earlier.

It seems reasonable to suggest that students who perceive their teacher as clear would be less confused about what it is they are expected to do and how to do it. As indicated in the discussion for question 4, the situation is complicated, however, by the finding that student perceived teacher clarity of presentation is positively related to both preinstructional student attitude toward mathematics ($r = .34, p \leq .01$) and mathematics competency ($r = .39, p \leq .01$). Student perceived teacher clarity of presentation was also positively ($r = .42, p \leq .01$) related to postinstructional attitude toward mathematics, a result which would be expected. As mentioned earlier, these results imply first of all, that a student's perception of how clear the teacher's presentation is may to a great extent be reflective of student predispositions toward mathematics. Most generally, students who have shown evidence of prior success in mathematics would likely

have more positive attitudes toward mathematics. Evidence in support of this hypothesis can be observed in the positive relationship found between student preinstructional attitude toward mathematics and mathematics competency ($\underline{r} = .33$, $p \leq .001$ for all students; $\underline{r} = .35$, $p \leq .01$ for observed students). (The correlation of preinstructional attitude with problem solving ability, while positive [$\underline{r} = .18$, $p \leq .01$ for all students; $\underline{r} = .18$, $p \leq .20$ for observed students] is not as dramatic.) The view of students with better attitudes and higher preinstructional achievement levels being better "equipped" to understand what the teacher is saying and what is to be done, makes intuitive sense. A partial correlation of the relationship of student perceived teacher clarity with engaged time, controlling for the effects of both student preinstructional attitude toward mathematics and student mathematics competency was non-significant ($\underline{r} = .10$; $t = .76$). Further support was provided in the relationship between observed teacher clarity and student perceived teacher clarity which was negative ($\underline{r} = -.13$, $p \leq .05$ for all students; $\underline{r} = -.27$, $p \leq .05$ for observed students). In other words, teachers who exhibited more verbal behaviors representative of teacher clarity had students who tended to perceive them as less clear. Without the results just presented, this last finding would seem

anomalous.

To examine this last relationship more closely, rather than use all 35 items on the student perceived clarity questionnaire to obtain a perceived clarity score only items directly reflective of those teacher behaviors thought to represent teacher clarity were used to calculate the perceived clarity score for each student. Items were chosen on the basis of whether they made direct reference to any of the six teacher verbal behaviors representing aspects of teacher clarity. Correlation results showed no significant relationship between student perception of teacher behaviors thought to represent teacher clarity and the actual occurrence of those same behaviors ($\bar{r} = -.03$, $p \leq .35$ for all students; $\bar{r} = -.12$, $p \leq .17$ for observed students). While the relationship was not significant, it tended, as before, to be negative. It should be said here that the correlation of the two perceived clarity scores was quite high ($\bar{r} = .89$, $p \leq .001$ for all students; $\bar{r} = .93$, $p \leq .001$ for observed students).

In summary, the results of this study suggest that there is a significant, positive relationship between both observed and student perceived teacher clarity of presentation, and student engaged time. The relationship of student perceived teacher clarity with student engaged time is, however, mediated by both

student prior achievement and student prior attitude toward mathematics. Students with higher prior achievement and prior attitude toward mathematics tend to also perceive their teacher as being more clear. When prior achievement and prior attitude are controlled for, the relationship between student perceived teacher clarity and student engaged time, while still positive, is not significant.

Discussion of Secondary Questions

Question: How is student engaged time related to student achievement?

Result: There was a positive, significant relationship between student engaged time and student achievement.

Recently, a great deal has been written with respect to student engaged time and its relationship to student achievement (see, for example, Berliner, 1979; Fisher et al., 1978; Romberg, Small & Carnahan, 1979). The Beginning Teacher Evaluation Study (BTES, Fisher et al., 1978) has reported the largest amount of data on this topic. The majority of work done relating student engaged time to student achievement has found modest, positive correlations reflecting a tendency for higher student engagement to predict higher student achievement. Results are somewhat confusing, however, in that not all studies controlled for the

effect of prior achievement. It is well known that prior achievement is a major predictor of postachievement. Therefore, it would seem reasonable to control for prior achievement when attempting to correlate anything with postachievement.

The significant relationship obtained is consistent with previous work. The finding that student engaged time is positively related to student achievement is one of those results which seems to make sense. Yet, one should probably ask why the relationship is not higher. One reason has already been mentioned; that being the large amount of variance in student achievement attributable to student prior achievement. Another reason probably lies in the methodology by which student engaged time is measured. The measurement of student engaged time by live classroom observers is subject to considerable judgment on the part of the observer as to what precisely constitutes student engaged time. There are instances of student behavior in which it is not clear whether the student is engaged in the ongoing activity or is off-task and not paying attention. These kinds of instances provide for measurement error which cannot be accurately estimated. In the ultimate sense, it is never clear just what the student is thinking at the time observation takes place. The observer has a good chance of determining whether a student's behavior is engaged or not.

But, one can never be sure. This brings us to the third reason.

The definition of what engaged time is will likely be a focal point of future research. Studies to date, including this one, have tended to view all engaged time as equivalent. Engaged time has been measured in a quantitative fashion partly to facilitate statistical analyses. The notion that engaged time has quality as well as quantity should help in understanding the true relationship of student engaged time with student achievement and classroom processes.

Question: What effect does providing teachers with student background and motivation strategy information have on student achievement?

Result: Students of teachers who were given both student background and motivation strategy information achieved significantly better than students of teachers who were given only student background information. Also, students of teachers given student background information achieved significantly better than students of teachers given no information.

The interest in this question was in part prompted by Morine's (1976) finding that fifth-grade mathematics teachers who noted the

use of pupil background information and/or pupil academic preparation in their planning, had students with higher gain scores at the end of the experimental teaching lesson. Since the students participating were part of the teachers own classroom group, it must be assumed that teachers were already familiar with pupil background information. The experimenter did not give any student information to teachers nor was the amount of information available to teachers controlled for. In this present study, no coding of planning statements was done with regard to specific noting of student background information.

Based on Morine's finding, one would predict the order in which the results occurred, assuming the information given to teachers about student aptitudes and motivation strategies will be used some way in the class. As indicated earlier, it seems information about motivation strategies was used. Whether or not student aptitude information was used is not readily apparent from the data at hand. The only real indication that student aptitude information was used is the reference to small groups or individuals in written planning as well as the actual occurrence of small groups in the classroom. It was also shown (see chapter 4), however, that the three treatment groups did not significantly differ in the quality of preinstructional planning done by teachers

(although the means for the three groups were in the predicted direction). It certainly could be the case that teachers used the student aptitude information given them in ways not necessarily observable. For example, an original premise of the study, although not examined, was the notion that teacher expectations about student performance play a large role in teacher planning as well as classroom processes. It was believed that conducting the study as soon as possible after the beginning of the school year would minimize those effects. This study actually began five days after the beginning of school. As a result, since participating classes were intact, teachers could already be forming expectations about their students, particularly if the teacher was aware of the overall, average ability level of the class (Joyce et al., 1977 cited in Clark & Yinger, 1978).

Indeed, when teachers who had been given aptitude information about their students were asked whether or not they had used that information, and if so, how, several responded that student information given them served only to confirm previous expectations. However, it is not clear just what effect this confirmation may have had on teacher planning or teacher verbal or non-verbal classroom behaviors. It could be argued that information about student aptitudes given to teachers at the beginning of the school

year, whether or not in a confirmatory role, would serve to allay confusion with regard to specific classroom procedures to be used in the coming days and weeks, assuming, of course, there is any confusion in the first place. Consequently, teachers who are given student aptitude information may be able to focus their instruction earlier with less use of classroom time for the purpose of diagnosis and preliminaries. The same argument could be extended to those teachers who were given not only student aptitude information, but also motivation strategy information. Information about specific classroom procedures found to be useful with certain types of students, if given to teachers along with student information, might also provide a means whereby more students become involved earlier in the instructional period.

Summary of Findings

In sum, the finding that student aptitude or motivation strategy information given to teachers did not significantly affect the quality of written preinstructional planning is consistent with evidence reported in several investigations (McCutcheon, 1979; Morine, 1976; Yinger, 1978). It seems likely that teachers develop both teaching and planning routines. The existence of planning routines would not allow much variation in planning format or content.

Teachers who indicated in written planning their awareness of small groups and/or individuals, as well as instructional procedures useful in dealing with those students, were not observed using more total motivation strategies. This result did not necessarily mean games/puzzles and competition were not referenced in written planning. Such references would have been coded activities or materials. Teachers who indicated large group activities and materials in written planning used significantly more games/puzzles and competition. The number of small group activity and materials planning statements was unrelated to use of games/puzzles and competition.

Planning statements focusing on individuals or small groups were positively related to use of small groups in classrooms. However, the relationship was not as large as might be expected. Two explanations were given for this result. First, planning statements focusing on individuals were not separated from statements focusing on small groups, and second, teacher definitions of small groups may differ. Teachers may internalize student groups which may not be observable in the classroom.

The fact that quality of teacher planning was not significantly related to observed teacher clarity can also be interpreted two ways. References to teacher verbal classroom statements in written planning were coded as instructions, not as verbal statements. However implied support was found for the possibility that few instruction planning statements include teacher verbal statements to be used in

the non-significant relationship of instruction planning statements to any observed teacher verbal classroom behavior. Evidence was also reported suggesting that the existence of planning statements categories does not necessarily imply occurrence of teacher behaviors believed representative of those categories. The possibility that teacher verbal behavior is generalizable, dependent on prior experience and independent of teacher planning, was also discussed.

The non-significant relationship of planning quality to student perceived teacher clarity was believed to be related to the notion of student perceptions being mediated to a degree by the student aptitudes of prior mathematics competency and attitude toward subject matter. Student aptitudes to an extent seem to predict student perceptions of teacher behavior. Such a finding is supported (Stayrook, Corno & Winne, 1978).

Total motivation strategy use seems not to predict amount of student engaged time. When each strategy (heterogeneous small groups, games/puzzles, competition) was examined separately, results indicated the non-significant relationship was a consequence of the very small association between small group use and engaged time. Students involved in either games/puzzles or competition tend to exhibit more engaged behavior. However, the relationships of games/puzzles and competition to engaged time, while significant, were not large.

The small, non-significant relationship of small group use with engaged time suggests that even in small groups, individual work predominates. Indirect support for this assumption was found in that pupils working individually tend to exhibit significantly less whereas pupils in large groups tend to exhibit more engaged behavior.

Both observed and student perceived teacher clarity were significantly related to engaged time. Teachers observed as being clear had students who were more engaged. If one considers several of the teacher behaviors observed, and believed representative of teacher clarity, as instances of teacher structuring behavior, then the result is consistent with prior work (Fisher et al., 1978). It is natural to expect more engagement if teachers have done an adequate job of structuring the day's lesson.

The relationship of student perceived teacher clarity with engaged time, while significant, seems to be influenced by both student prior mathematics competency and attitude toward mathematics. When prior mathematics competency and attitude toward mathematics are controlled for, the relationship between perceived clarity and engaged time becomes non-significant. The finding that observed clarity was unrelated to perceived clarity makes sense if one considers the results reported above.

The relationship between student engaged time and student achievement has been proposed to be an important one (Berliner,

1979; Fisher et al., 1978; Romberg, Small & Carnahan, 1979). Results of this study were consistent with previous work in that a moderate, significant relationship was found between engaged time and achievement. Students who were more engaged tended to achieve more as well. That the association was not higher was believed to be a function of coding procedure and the nature of engaged time. It is expected once more accurate means are available for assessing engaged time in all its forms, more accurate predictions of achievement from engaged time will be made.

Finally, teachers given both student aptitude and motivation strategy information had students with higher postachievement scores than teachers given only student aptitude information. In addition, teachers given only aptitude information had students who achieved significantly better than teachers given no information. These findings are in agreement with data reported by Morine (1976).

The fact that teachers used motivation strategy information is documented. Teacher use of student aptitude information may not be as observable, and may be tied to the notion of teacher expectations. It was argued that information given about students as well as specific procedures useful in the classroom, may serve to focus instruction at an earlier time, thus allowing more time for meaningful instruction to occur.

Limitations and Conclusions

Problems which might occur when conducting classroom research are almost limitless. Some are not easily dealt with and are in part a natural consequence of doing classroom research. Such problems face almost all educational research.

It is virtually impossible to obtain access to a truly representative sample. And as Gage (1978) suggests, total randomization of students is not always possible, nor is it altogether necessary as long as classes or teachers can be randomly assigned to treatments. With regard to sample size, since teachers were the unit of analysis for part of the study, the fact that only nine teachers participated presents a considerable problem. The problem is reflected in the severely diminished statistical power in those tests for which the teacher was the unit of analysis. If within treatment group variability is large (as in the case here), the chances of finding a significant between treatment group effect are severely reduced when n is small. It is possible that effects may have been present, but due to the small sample size they could not be identified. These and other basic difficulties are well known.

A second group of limitations lie in the actual design and implementation of the study itself.

In this regard, a major concern is whether experimental treatments used actually differ enough for their effects to be noticeable. In this study, treatment differences were easily identified and no

111

treatment overlapped with any other. However, it is not clear if substantial qualitative differences existed among the three treatments. Some teachers were given aptitude information about individual students and others were not. As some teachers indicated at the conclusion of the study, they believed student information given them served to confirm previous expectations. If this is true, then even those teachers not given specific student information likely possessed similar information in the form of expectations. The same difficulties occur when comparing teachers who were given motivation strategy information and those who were not. It is possible that most teachers are familiar with the use of games/puzzles as a motivation technique. Since use of competition is closely tied to use of games, it, too, would indirectly be familiar to most teachers. In contrast, use of small groups is not often considered a motivation strategy. Consequently, classroom use of small groups would more likely be influenced by information given. Findings indicated such was the case. As was briefly mentioned in chapter 2, the term motivation is here used in a pedagogical sense. It is clear that many other definitions of motivation exist (see, for example, Korman, 1974) and that from a psychological as well as an educational point of view, some of these may more accurately reflect the nature of an individual's motivation state. In a sense,

then, the use of (a) a narrowly defined set of strategies which may or may not influence motivation in all its forms as well as (b) instruments which might not measure motivation at all, are limitations which must be considered.

Very specific teacher verbal behaviors were examined in this study. The behaviors were chosen because it was believed they represent teacher clarity of presentation in mathematics classes. It could be argued that some of the behaviors are generalizable to teacher clarity in other subject matter presentation. However, it is not clear they would be. Several teacher behaviors occurred so infrequently, it is hard to understand how they might be related to student outcomes. In addition, calculation of observer reliability estimates is difficult when based on behaviors which occur infrequently. Other work investigating teacher clarity may provide measures applicable to a wider range of teaching situations.

With respect to student behaviors observed, difficulties associated with the measurement of student engaged time have already been hinted at. In almost every instance, whether a student is observed as engaged or off-task is ultimately based on subjective judgment. This is not to say in every case the observer had a 50/50 chance of being correct in his observation. The problem then becomes one of definition. As mentioned earlier, this study treats all engaged time as identical; an assumption which is

probably not warranted. For example, is engagement in directions the same as engagement in content? Is engagement at the beginning of the period the same as engagement at the end? In a sense we are speaking about the quality of engaged time. One cannot assume a student who spends 60 minutes engaged is somehow better off than one who is engaged 30 minutes.

A major question with the observation procedure in general would seem to be, how generalizable are coded instances of behavior to the classroom as a whole. The fact that observations occur only once every 30 seconds, and that a substantial period of class time exists in which no observations are made, at first appears problematic. However, work now being done (Romberg, Carnahan, Evanson & Buchanan, in preparation), suggests the coding scheme is generalizable, particularly in relation to certain primary variables (for example, engagement, teacher speaking, student speaking, grouping, and the like).

A third aspect of classroom observation needs to be mentioned. Although considerable effort was given to the preparation of observer training materials, training sessions were likely inadequate in terms of time available. Only two of the five observers participated in both training sessions. Three observers were recruited at the last minute and participated only in the second training session. Although

the second session was more crucial in that actual practice coding took place, the latter three observers had not had a chance to read the manual and respond as did the first two observers. In addition, a practice in-class coding session would have been useful.

Generalizability of the study can also be questioned from two other perspectives: time given to teach the topic and the topic itself. In part, these two concerns can be categorized as beyond the experimenter's control. Although both the time and topic were initially determined by the experimenter, both had to be approved by the participating school district and teachers. Yet limitations are presented by the choices. It is questionable whether significant behavior shifts or treatment effects can be determined in such a relatively short time period. Also, it is not clear that effects observed are stable. With respect to the topic chosen, as Janicki (1979) has suggested, it is sequential in nature with many prerequisites assumed. As such, results obtained may be applicable only to similar subject matter.

A crucial limitation of the study lies in the procedure used to obtain a measure of planning quality. Written planning is generally outline in form and hence, limited in the extent to which it reflects mental planning the teacher has previously done. Certain planning categories used in this study (for example the category objectives) might occur more frequently if one were to

examine the mental planning of teachers rather than written planning. A second problem with the planning variable, not unrelated to the first, arises when one considers the scaling procedure used. Quality of planning could likely be defined in many ways. As such, different results might be anticipated if different scaling methods are used.

In relation to analyses, results based on correlations must be considered carefully. Correlations are subject to a wide variety of difficulties. First of all, the old maxim that correlation does not imply causation must be remembered. Second, any correlation is particularly susceptible to outlying data. Extreme care must be taken in order that results do not reflect data which is misleading (Janicki, 1979).

One other item needs to be mentioned. Scores based on Likert scales can be questioned on two counts: first, although it is assumed that qualitative "distance" between two adjacent responses in a Likert system is identical to the distance between any two adjacent responses, clearly, such an assumption is questionable. The second complication is based on the first. Response to a Likert-type questions is determined by the respondent's interpretation of each answer's relative magnitude (Janicki, 1979). It is probable that differences in interpretation will exist. In fact, individual patterns of responding seem to emerge, and will most likely affect

scores obtained. Those patterns of responding have been referred to as "response styles" (Cronbach, 1960). As an example, one student may rarely use the two extreme response categories when answering while another may use only those two. As Janicki (1979) indicates, if an individual's response style can be determined, scores obtained could more accurately be interpreted.

In conclusion, research examining teacher planning and the more general area of teacher decision making has begun only recently. Particularly, the number of studies investigating teacher planning are few. The assumption that teacher planning has a significant effect on classroom processes as well as student outcomes has been held for some time. Only now are we beginning to see what those effects might be. Results of this study support the work of other researchers (Morine, 1976; Peterson, Marx & Clark, 1978) in suggesting teacher planning is related to aspects of classroom organizational and interactive environments. In addition, this study has shown certain teacher behaviors are related to student engaged time which in turn is related to student achievement. Such a result is consistent with a variety of reported findings (for example, Fisher et al., 1978; Stallings & Kaskowitz, 1974). Data suggest teacher clarity of presentation is an important variable to look at when considering teacher verbal behaviors which may influence student outcomes in mathematics classes.

How a teacher plans or what the format of written planning looks like, is probably determined by a number of factors. However, it seems teacher background might be a major influence. Also, use of student aptitude information in planning classroom instruction would likely be desirable. Written planning appears to serve as a cue for remembering important aspects of prior mental planning. As such, future research should investigate the relationship of mental to written planning. More research should be conducted to further clarify the relationship of mental planning to classroom processes; particularly in regard to student outcomes. The use of audio recording as a means to enable teachers to verbalize their mental planning would seem to be a fruitful prospect. Such recording would likely allow for a more accurate representation of preinstructional teacher planning and would probably result in increased variability both in terms of format, as well as content of planning done.

Studies of teacher planning conducted over a longer period of time are needed to more accurately estimate presumed planning effects. Also, natural teacher planning in normal school situations should be observed. Contrived planning situations give a perspective of planning which is more specific, and hence, limited in nature. Natural studies conducted over a longer period of time

would enable one to associate results obtained from shorter, experimental studies with results obtained in natural settings.

As Janicki (1979) points out, it is useful to collect observation data even when controlled treatments are being used. Observation data allows one to interpret findings (especially if one is interested in student outcomes) in terms of actual classroom events. As is often the case, classroom events are sometimes found to mediate treatment effects. Generally, classroom research experiments cannot be so tightly controlled that one is able to disregard the many in-class factors which may indeed have a bearing on the final outcome.

This study was an attempt to better understand the relationships among quality of teacher planning, aspects of the classroom environment and student outcomes, specifically engaged time and achievement. Findings reported are important for both teachers and administrators. First, they help explain how teacher planning is related to classroom instruction and in turn, how classroom instruction is related to student outcomes. The data suggest that planning is related to the classroom environment. Second, using student background or aptitude information when planning might possibly allow for more effective adaptation of instruction to fit individual or small group needs. And third, the results have implications when considered as helping teachers become aware of how their planning and classroom behavior may effect the amount of time students actually spend working.

References

- Berliner, D.C. Tempus educare. In P.L. Peterson & H. Walberg (Eds.), Research on teaching. Berkeley, California: McCutchan, 1979.
- Braun, C. Teacher expectation: Sociopsychological dynamics. Review of Educational Research, 1976, 46, 185-213.
- Bright, G.W., Harvey, J.C., & Wheeler, M.M. Cognitive effects of games on mathematics learning. Paper presented at the annual meeting of the National Council of Teachers of Mathematics. Cincinnati, Ohio, 1977.
- Bush, A.J., Kennedy, J.J., & Cruickshank, D.R. An empirical investigation of teacher clarity. Journal of Teacher Education, 1977, 23, 53-58.
- Carroll, J.T. A model of school learning. Teachers College Record, 1963, 64, 723-732.
- Clark, C.M., & Yinger, R.J. Research on teacher thinking. (Research Series No. 12). East Lansing, Michigan: Institute for Research on Teaching, 1979.
- Clark, C.M., Yinger, R.J., & Wildfong, S.C. Identifying cues for use in studies of teacher judgment. (Research Series No. 23). East Lansing, Michigan: Institute for Research on Teaching, 1978.

Cronbach, L. Essentials of psychological testing. New York:

Harper & Row, 1960.

Cronbach, L., Gleser, G., Nanda, M., & Rajaratnam, N. The

dependability of behavioral measurements: Theory of

generalizability for scores and profiles. New York:

Wiley, 1972.

Cronbach, L., & Snow, R. Aptitudes and instructional methods.

New York: Irvington, 1977.

Davidoff, S.H. The development of an instrument designed to

secure student assessment of teacher behaviors that

correlate with objective measures of student achievement.

Philadelphia: Philadelphia School District, Office of

Research and Evaluation, 1970. (ERIC Document Reproduction

Service No. ED 039 170)

Dunkin, M.J. Student characteristics, classroom processes,

and student achievement. Journal of Educational

Psychology, 1978, 70, 998-1009.

Dunkin, M.J., & Biddle, B.J. The study of teaching. New York:

Holt, Rinehart and Winston, 1974.

Dunkin, M.J., & Doenau, S.J. A replication study of unique and

joint contributions to variance in student achievement.

Unpublished manuscript.

- Fisher, C., Berliner, D., Filby, N., Marliave, R., Cahen, L., Dishaw, M., & Moore, J. Teaching behaviors, academic learning time and student achievement: Final report of Phase III-B, Beginning Teacher Evaluation Study. (Technical Report V-1). San Francisco: Far West Laboratory, 1978.
- Gaa, J. Goal-setting behavior, achievement in reading, and attitude toward reading associated with individual goal-setting conferences. (Technical Report No. 142). Madison: Wisconsin Research and Development Center for Cognitive Learning, 1970.
- Gage, N.L. The scientific basis of the art of teaching. Columbia University: Teachers College Press, 1978.
- Hiller, J.H. Verbal response indicators of conceptual vagueness. American Educational Research Journal, 1971, 8, 151-161.
- Hiller, J.H., Fisher, G.A., & Kaess, W. A computer investigation of verbal characteristics of effective classroom lecturing. American Educational Research Journal, 1969, 6, 661-675.
- Janicki, T.C. Aptitude treatment interaction effects of variations in direct instruction. Unpublished doctoral dissertation, University of Wisconsin-Madison, 1979.
- Johnson, D., & Ahlgren, A. Relationship between student attitudes about cooperation and competition and attitudes toward schooling. Journal of Educational Psychology, 1976, 68, 92-102.

- Johnson, D., & Johnson, R. Instructional goal structure: Cooperative, competitive, or individualistic. Review of Educational Research, 1974, 44, 213-240. (a)
- Johnson, D., & Johnson, R. Goal structures and open education. Journal of Research and Development in Education, 1974, 8, 30-46. (b)
- Johnson, D., & Johnson, R. Learning together and alone: Cooperation, competition, and individualization. Englewood Cliffs, New Jersey: Prentice-Hall, 1975.
- Johnson, D., & Johnson, R. Many teachers wonder ... will the 'special-needs' child ever really belong? Instructor, 1978, 152-154.
- Johnson, D., Johnson, R., Johnson, J., & Anderson, D. Effects of cooperative versus individualized instruction on student prosocial behavior, attitudes toward learning, and achievement. Journal of Educational Psychology, 1976, 68, 446-452.
- Johnson, D., Skon, L., & Johnson, R. Effects of cooperative, competitive, and individualistic conditions on children's problem-solving performance. American Educational Research Journal, 1980, 17, pp. 83-93.
- Johnson, D.A. Commercial games for the arithmetic class. In S.E. Smith & C.A. Backman (Eds.), Games and puzzles for elementary and middle school mathematics. Reston, Virginia: National Council of Teachers of Mathematics, 1975.

- Kash, M.M., & Borich, G.D. Teacher behavior and pupil self-concept. Reading, Massachusetts: Addison-Wesley, 1978.
- Kennedy, B.J. Motivational effects of individual conferences and goal setting on performance and attitudes in arithmetic. (Technical Report No. 61). Madison: Wisconsin Research and Development Center for Cognitive Learning, 1968.
- Kennedy, J.J., Cruickshank, D.R., Bush, A.J., & Meyers, B. Additional investigations into the nature of teacher clarity. Journal of Educational Research, 1978, 72, 3-10.
- Klausmeier, H., Diluzio, G.L., & Brumet, M.L. First year of intervention study to facilitate children's concept learning. (Working Paper No. 159). Madison: Wisconsin Research and Development Center for Cognitive Learning, 1976.
- Klausmeier, H., Jeter, J., Quilling, M., Frayer, D., & Allen P. Individually guided motivation. Madison: Wisconsin Research and Development Center for Cognitive Learning, 1975.
- Korman, A.K. The psychology of motivation. Englewood Cliffs, New Jersey: Prentice-Hall, 1974.

- McCutcheon, G. How elementary school teachers plan their curriculum: Findings and research issues. Paper presented at the annual meeting of the American Educational Research Association, 1979.
- Medley, D.M. Teacher competence and teacher effectiveness: A review of process-product research. Washington, D.C.: American Association of Colleges for Teacher Education, 1977.
- Morine, G. A study of teacher planning. Special Study C. Beginning Teacher Evaluation Study. San Francisco: Far West Laboratory, 1976.
- Peterson, P.L., & Janicki, T. Individual characteristics and children's learning in large-group and small-group approaches. (Technical Report No. 496). Madison: Wisconsin Research and Development Center for Individualized Schooling, 1979.
- Peterson, P.L., Marx, R.W., & Clark, C.M. Teacher planning, teacher behavior, and student achievement. American Educational Research Journal, 1978, 15, 417-432.
- Porter, A., Schmidt, W., Floden, R., & Freeman, D. Impact on what?: The importance of content covered. (Research Series No. 2). East Lansing, Michigan: Institute for Research on Teaching, 1978.

Program on Teaching Effectiveness, SCRDT A factorially designed experiment on teacher structuring, soliciting and reacting. (R & D Memorandum No. 147). Stanford, California: Stanford Center for Research and Development on Teaching, 1976.

Quilling, M., Cook, D., Wardrop, J., & Klausmeier, H. Research and development activities in R & I units of two elementary schools of Milwaukee, Wisconsin, 1966-1967. (Technical Report No. 46). Madison: Wisconsin Research and Development Center for Cognitive Learning, 1968.

Quilling, M., Fischbach, T., Rendfrey, L., & Frayer, D. Individual goal-setting conferences related to subject-matter learning: A report on the field test. (Technical Report No. 190). Madison: Wisconsin Research and Development Center for Cognitive Learning, 1971.

Romberg, T.A. Examples from "Towards a theory of pedagogy". (Project Paper 77-9). Madison: Wisconsin Research and Development Center for Cognitive Learning, 1977.

Romberg, T., Carnahan, R., Evanson, J., & Buchanan, A. Generalizability of observed teacher and pupil behaviors. Madison: Wisconsin Research and Development Center for Individualized Schooling, in preparation.

Romberg, T., Harvey, J., Moser, J., & Montgomery, M. Developing mathematical processes. Chicago: Rand McNally & Company, 1974, 1975, 1976.

- Romberg, T.A., Small, M., & Carnahan, R. Research on teaching from a curricular perspective. (Theoretical Paper No. 81). Madison: Wisconsin Research and Development Center for Individualized Schooling, 1979.
- Shavelson, R., Caldwell, J., & Izu, T. Teachers sensitivity to the reliability of information in making pedagogical decisions. American Educational Research Journal, 1977, 14, 83-97.
- Small, M.S., Carnahan, R., & Romberg, T.A. Data from classroom observations for Topic S-1. (Project Paper 79-8). Madison: Wisconsin Research and Development Center for Individualized Schooling, 1980. (a)
- Small, M.S., Carnahan, R., & Romberg, T.A. Data from classroom observations for Topic S-2. (Project Paper 79-9). Madison: Wisconsin Research and Development Center for Individualized Schooling, 1980. (b)
- Small, M.S., Romberg, T.A., & Carnahan, R. Teacher-student observation procedures and the training of observers for Coordinated Study #1. (Project Paper 79-5). Madison: Wisconsin Research and Development Center for Individualized Schooling, 1979.
- Stallings, J., & Kaskowitz, D. Follow through progress classroom observation evaluation 1972-1973. Menlo Park, California: Stanford Research Institute, 1974. (ERIC Document Reproduction Service No. ED 104 969)

Stayrook, N., Corno, L., & Winne, D. Path analyses relating student perceptions of teacher behavior to student achievement. Journal of Teacher Education, 1978, 29, 51-56.

Thompson, J.M. The effect of pupil characteristics upon perception of their teacher. Psychology in the Schools, 1969, 6, 206-212.

Wearne, D. Development of a test of mathematical problem solving which yields comprehension, application and problem solving scores. (Technical Report No. 407). Madison: Wisconsin Research and Development Center for Cognitive Learning, 1976.

Webb, N. Observers manual II: Phase IV, IGE evaluation project. Madison: Wisconsin Research and Development Center for Individualized Schooling, 1978.

Westbury, I., & Bellack, A.A. (Eds.). Research into classroom processes: Recent developments and next steps. Columbia University: Teachers College Press, 1971.

Wright, C.J., & Nuthall, G. Relationships between teacher behaviors and pupil achievement in three experimental elementary science lessons. American Educational Research Journal, 1970, 7, 477-490.

Yinger, R.J. A study of teacher planning: Description and a model of preactive decision making. (Research Series No. 18). East Lansing, Michigan: Institute for Research on Teaching, 1978.

Zahorik, J.A. The effect of planning on teaching. The Elementary School Journal, 1970, 71, 143-151.

Zahorik, J.A. Teachers' planning models. Educational Leadership, 1975, 33, 134-139.

Center Planning and Policy Committee

Richard A. Rossmiller
Center Director

Dale D. Johnson
Area Chairperson
Studies in Language:
Reading and Communication

Marvin J. Fruth
Area Chairperson
Studies in Implementation
of Individualized Schooling

Penelope L. Peterson
Area Chairperson
Studies of Instructional Programming
for the Individual Student

James M. Lipham
Area Chairperson
Studies of Administration and
Organization for Instruction

Thomas A. Romberg
Area Chairperson
Studies in Mathematics and Evaluation
of Practices in Individualized Schooling

Associated Faculty

Vernon L. Allen
Professor
Psychology

B. Dean Bowles
Professor
Educational Administration

Thomas P. Carpenter
Associate Professor
Curriculum and Instruction

W. Patrick Dickson
Assistant Professor
Child and Family Studies

Lloyd E. Frohreich
Associate Professor
Educational Administration

Marvin J. Fruth
Professor
Educational Administration

Dale D. Johnson
Professor
Curriculum and Instruction

Herbert J. Klausmeier
V.A.C. Henmon Professor
Educational Psychology

Joel R. Levin
Professor
Educational Psychology

James M. Lipham
Professor
Educational Administration

Dominic W. Massaro
Professor
Psychology

Donald M. McIsaac
Professor
Educational Administration

Wayne Otto
Professor
Curriculum and Instruction

Penelope L. Peterson
Assistant Professor
Educational Psychology

Thomas S. Popkewitz
Professor
Curriculum and Instruction

Gary G. Price
Assistant Professor
Curriculum and Instruction

W. Charles Read
Professor
English and Linguistics

Thomas A. Romberg
Professor
Curriculum and Instruction

Richard A. Rossmiller
Professor
Educational Administration

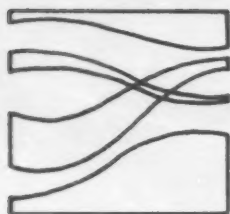
Peter A. Schreiber
Associate Professor
English and Linguistics

B. Robert Tabachnick
Professor
Curriculum and Instruction

Gary G. Wehlage
Professor
Curriculum and Instruction

Louise Cherry Wilkinson
Associate Professor
Educational Psychology

Steven R. Yussen
Professor
Educational Psychology



Technical Report No. 541

The Effects of Teacher Planning on Classroom Processes

by Richard Stanley Carnahan, Jr.

May 1980

Wisconsin Research and Development
Center for Individualized Schooling

APPENDICES

APPENDIX A

Classroom Model of Instruction -
Variable and Relationship Definitions

VIII

SUMMARY

by

Thomas A. Romberg, Marian Small,
and Richard Carnahan

In this chapter we present a revised model of pedagogy based upon our literature review. We will define elements of the model and discuss their relationships. We end by reflecting on the modeling process, on our conclusions, and on ideas that remain to be developed.

A Revised Model of Pedagogy

Our original model (Figure 8 in Chapter I) had 14 variables organized under three general headings: content, means of instruction, and outcomes. In our revised model we propose four categories: the three original categories and a background category. The means of instruction category originally had four subcategories: motivation, planning, direct instruction, and pupil pursuits. In the new model three subdivisions are made: planning, classroom events, and pupil pursuits. Motivation was dropped not because we found it unimportant but because motiva-

tional elements are involved both in planning and in classroom events. The term classroom events was chosen as a replacement for direct instruction primarily because direct instruction has come to indicate a particular style of instruction (cf. Rosenshine, 1978) rather than a subcategory of pedagogic behaviors. Thus, direct instruction is now a label for a particular pattern of classroom events.

Next, from our review we have identified 19 variables (instead of 14) and we distinguish between two types of variables: specific and general. Specific variables are well described, refer to actions, and can be scaled. General variables are not well defined. In specific studies, the aspects of a general variable of interest would need to be described before scaling could proceed for each. The relationships between these general variables and other variables are tenuous, and indeed may vary from study to study.

The Background Elements

Two general variables have been identified for inclusion in this new but necessary category. The variables are:

TB = Teacher Background. This general variable refers to characteristics the teacher brings to the in-

structional scene. Both personal characteristics and those acquired through training may be included.

PB = Pupil Background. In a similar manner this general variable refers to characteristics the pupil brings to the instructional scene. It too includes both personal characteristics and skills previously acquired.

The Content Elements

Three specific elements have been identified in this category. In the original model two content elements, content unit structure (CUS) and content segmentation and sequencing, were specified. We have divided the original content unit structure element into two elements, one to reflect the "goals" and one the "richness" of a particular content unit. From the review of content-related questions (Chapter II) we have decided that the three-part content unit structure element contains eight subelements: concreteness, diversity of approach, applications, explorability, importance and clarity of objectives, algorithmic nature of teaching, encouragement of pupil discussion, and intended outcomes. Thus, the components of the content category are as follows:

CG = Content Goals. This element is derived by considering:

a. Importance and Clarity of Objectives

Content is categorized by activity according to whether it is judged by the teacher to be of little importance, moderate importance, or great importance to pupils. The materials are examined and the teacher questioned to see if the activity clearly meets its objectives.

b. Algorithmic Nature of Teaching

Content is judged by activity according to whether the teacher is expected to teach it in an algorithmic, routinized manner and whether this is actually done.

c. Intended Outcome

Content is categorized by activity as to its intended outcome, be it maintenance of previously learned material, acquisition of new material, or preparation for later work. The point of view of the curriculum designer and the point of view of the teacher are taken into account.

CR = Content Richness. This element is derived by considering:

a. Concreteness

Content is categorized by activity, both in terms of opportunities to use manipulatives or

play games in learning it, and the actual use of these items in instruction.

b. Diversity of Approach

Content is categorized based on topic objectives in terms of whether more than one basic approach is made available for instruction, and whether more than one basic approach is actually used by the teacher. The extent of repetition of each approach is also measured. On a broader basis, a program is analyzed to determine whether it attempts to structure its topics by using unifying cognitive themes.

c. Applications

Content is categorized by topic and activity according to whether a variety of applications within the scope of the students' abilities exists, and whether the pupils actually meet this variety. The applications themselves are examined as to whether they are primarily artificial ones or realistic, whether they are set into games, and whether they are designed primarily to practice or are placed in units designed to teach other content.

d. Explorability

Content is categorized by topic according to whether a number of student investigations of the material are feasible and whether such investigations are actually assigned. A distinction is made between highly structured explorations and more open investigations.

e. Encouragement of Pupil Discussion

Content is judged by activity to determine whether pupils are encouraged to discuss content with one another or with the teacher. This type of discussion is in contrast to simple responses to direct teacher questions.

CSS = Content Segmentation and Sequencing. This element is derived by considering:

a. Hierarchical Nature

Content is categorized by topic according to whether it has a critical set of curriculum prerequisites essential for its comprehension, and whether this is taken into account in instruction by the materials and by the teacher. Also judged is whether the activities included in a topic build in a systematic way and whether

the teacher makes reference to relevant prior work in instruction.

b. Content Segmentation

Content is categorized by activity according to whether the activity is written cohesively, with an introduction, development, and conclusion, and whether it is taught that way.

c. Flexibility of Sequencing

Activities within topics and topics within programs are examined to see if alternative sequencing suggestions are provided to the teacher.

From the descriptions of these variables it should be clear that each includes both the features implied in the curriculum materials (what could be reasonably expected or anticipated), and what is actually done in the school. Thus, to scale these variables three sources of information must be used--data gathered through an investigation of the curriculum materials, data from interviews with teachers, and data from classroom observations.

The Planning Elements

The planning subcategory of the original model contained elements, information (a source for planning), and informed

decision making. From our review of literature it became apparent that these elements were unsatisfactory. We now propose six variables: three deal with the information, expectations, and perceptions teachers have about instruction and how these ideas are used in planning; three deal with the details of the planning process and its product as perceived by the teacher. The variables are:

IP = Information about Pupils. This element is derived from the student background information which is available to the teacher and includes:

- a. a record of prior achievement;
- b. a judgment of the pupils' persistence or willingness to attend to a task; and
- c. a judgment of the pupils' independence.

IC = Information about Content. This element is derived from the information available to the teacher about the content area being taught and includes:

- a. specific information about the content goals of the unit;
- b. knowledge of how the unit goals are related to other goals and their importance in that relationship; and

- c. an understanding of the role of review and preparatory activities in content sequences.

PE = Perceived Ease of Instruction. This element is derived from information about the teacher's perception of the ease of instruction for particular activities and includes:

- a. perception of ease of student management for particular activities;
- b. perception of ease of preparation for each activity; and
- c. perception of time needed by students to complete activities.

PP = Pupil Planning. This element refers to the specific instructional planning the teacher does which concentrates on students in the class.

PC = Planning Content. This element refers to the instructional planning the teacher does which concentrates on the content to be taught.

PS = Planning Specificity. This element refers to how specific or detailed the teacher plans are.

These six planning variables include availability of information (such as from files of pupil records), prior knowledge of both pupils and content, teacher expectations, and the actual plans teachers make. Thus, to scale these variables information

must be collected from an examination of work samples (the unit and lesson plans of teachers), from interviews of teachers, and from the records available to teachers.

The Classroom Events Elements

This newly labeled subcategory of means of instruction also contains six elements. The subcategory, called Direct Instruction, had four elements: structuring comments, organizational environment, interactual environment, and allocated time. The notions behind those variables have been retained, but reorganized into three elements which were derived from the literature review.

The variables are:

MOT = Motivation. This element refers to the overall evidence of student motivation observable in the classroom. It includes strategies the teacher may use based on both available information about students and on information about content.

ROE = Richness of the Organizational Environment. This element refers to:

- a. the variety of learning activities in a given lesson and over the course of a topic;
- b. the grouping (large, small, or an individual) to which each student observed is assigned, and teacher criteria for determining grouping;

- c. the extent and appropriateness of the use of physical materials; and
- d. the levels of student and teacher mobility.

IOE = Independence of the Organizational Environment. This element refers to:

- a. whether the student is engaged in a structured activity;
- b. whether an activity is taught algorithmically where the teacher attempts to control the pupils' thinking processes, and the appropriateness of this procedure for a given objective;
- c. the timing, amounts, and appropriateness of teacher-directed and independent work; and
- d. the extent of teacher monitoring of independent work.

IE = Interactive Environment. This is the key element in describing classroom events. After lengthy discussions we have chosen to leave IE as a single variable although it contains five different aspects, each of which could be considered an important variable in its own right. The five aspects are verbal interactions, structuring comments, soliciting, reacting, and explaining.

Verbal interactions include interactions of students in terms of:

1. direction, that is who is speaking to whom; and
2. the other participants--teacher, student, or other adult.

For the teacher, we include verbal interactions in terms of:

1. direction, whether the teacher is speaking or listening;
2. the size of the group (small, large, or an individual) the teacher speaks to; and
3. whether the verbalization is a question.

For both teacher and pupils, we include whether the interaction is regarding mathematics content, directions related to that content, or neither. We also record whether interactions are public or private.

Structuring comments we believe are important in predicting pupil behaviors are those:

1. relating work to past or future learning;
2. outlining objectives of an activity; and
3. summarizing or reviewing content.

We believe their effects to be mediated by pupil perception of these types of statements.

The third aspect contained in the IE element is soliciting. Teachers vary in the amount of questioning they do and the types of questions they ask. We have included three main types of teacher questions:

1. low-order questions;
2. high-order questions; and
3. management questions directly related to content.

The last type of question is included to maintain a distinction between solicitations regarding substantive matters and those regarding directions.

Reacting moves are teacher behaviors which occur after a pupil response. From our review of literature we believe the following occurrences are important:

1. the informativeness of feedback as either high information or low information;
2. the absence of feedback when it is expected;
3. the sign of feedback as either positive, negative, or neutral; and
4. teacher strategy changes.

Explaining, the fifth aspect of the IE element, includes explaining of content or directions, not structuring, soliciting, or reacting. The teacher talks and the students listen. Much classroom talk falls in this category. We believe instances in which the teacher:

1. explains content; or
2. explains directions are important.

We use the word explain here broadly to imply any teacher exposition. Also, the clarity of explanation must be considered.

AT = Actual Learning Time. This element refers to the time allowed for learning or opportunity to learn. A teacher may allocate time differently for various types of pupils, classes, or content of different levels of importance or complexity. Therefore, we suggest that only actual learning time as a subset of available (or allocated) time be used as a predictor of pupil activities.

PI = Pacing of Instruction. This element refers to the teacher's establishment of a pace for the class (and groups) to cover materials. Thus, the actual time per unit of instruction is used as an index of pace.

From the descriptions of these six variables on classroom events we expect to capture the salient features of what is involved in the complex teacher-student-content interactions which occur in classrooms. To scale all these variables, observational data based on time samples appear to be an appropriate procedure.

Pupil Pursuits

One general variable has been identified for inclusion in this category. The variable is:

ET = Engaged Time. This variable refers to the amount of time each pupil is actively engaged in learning content material..

This has been left as a general variable since this description may be qualified in terms of task relevance, time needed, and so on. In any particular study an operational definition which fits the objectives of that study must be developed.

Outcomes

One general variable has also been identified for inclusion in this category. The problem here is specifying which set of outcomes one is interested in examining. For generality the variable is:

SO = Student Outcomes. This element refers to all the possible student outcomes one could identify which are influenced by schooling.

Relationships Between Elements

For these 19 variables we are willing to posit 31 specific relationships as follows.

1. PB → SO Prior pupil achievement (attitude and so on) influences later student outcomes (achievement, outcomes, and so on).
2. PB → IP Actual pupil background should influence the information that is available about pupils.
3. TB → IC Teacher content preparation should influence the teacher's understanding of the information about content.
4. TB → PE The teacher's experience should influence perceptions of management, preparation, and pacing.
5. TB → IE The teacher's experience should influence the variety of teacher behaviors involved in interacting with pupils.
6. CG ↔ CSS (a) If a teacher sees a topic as particularly important, then attention is given to developing an appropriate sequence.
(b) Knowing that a pupil has prerequisites or needs prerequisites should affect the intended outcome.

7. CSS → IP If records of mastery of prerequisites are kept, then information on pupils is available.
8. CSS → PS Amount of segmentation and sequencing determines the amount of specific planning needed.
9. CSS → IC The way content is sequenced provides information about content.
10. CR → IC The richness of content is certainly information about content.
11. CR → PE The richness of content should influence (probably inversely) the perceived ease of instruction.
12. CG → IC The objectives of a unit are certainly information about content.
13. CG → PE The importance of a unit should influence the teacher's perceptions of how much effort needs to be expended for the unit.
14. IP → MOT Teachers may use information about students as a basis of a motivational strategy.
15. IP → PP Student background information available to the teacher should directly influence the instructional planning done by the teacher with regard to those students.
16. IC → PC The teacher's knowledge of content should, in part, determine instructional planning which deals with the content to be taught.

17. PE → PP Management expectations should influence planning for students.
18. PE → PI Perceived pace should influence actual pace of instruction.
19. PP → MOT Planning done with students in mind should influence particular motivational procedures used in the classroom.
20. PP → IOE Planning done with students in mind should directly influence the level of student independence which is operative in the classroom.
21. PS → IE Specificity of teacher planning (e.g., use of specific examples, explanations, questions, and so on) should influence the interactive environment of the classroom.
22. PC → MOT Planning done with content in mind should influence the choice of motivational procedures used in classrooms.
23. PC → ROE Planning for content will influence the richness of the organizational environment in terms of variety of activities and procedures used.
24. MOT → IOE Motivational strategies used should directly influence the level of student independence in the classroom.

25. IOE $\rightarrow$ IE If children work independently, they do not interact very often. More feedback is given to individuals than to groups.
26. IOE $\rightarrow$ PT If teachers instruct large groups, the pace is more homogeneous.
27. ROE $\rightarrow$ IE In a rich environment we expect more structuring comments, more pupil talk, more direction giving as activities change or manipulatives are explained, and more content talk.
28. IE $\rightarrow$ ET The quality of the teacher talk and the level of peer interaction affect pupil ability to understand tasks and be engaged. If teachers talk too much, children cannot work.
29. AT $\rightarrow$ P Pacing is a subset of actual learning time.
30. P $\rightarrow$ ET Engaged time is clearly influenced by pace of instruction.
31. ET $\rightarrow$ SO What pupils do should influence their outcomes.

APPENDIX B

Teacher Planning Model -
Variable Definitions and Scaling Procedures

This appendix describes variables comprising the model of teacher planning introduced in chapter two in terms of the methods by which each variable is assessed. Where appropriate, examples are given which outline the intended scoring procedures used.

Student Information

The variable Student Information refers to background information about students which teachers have available prior to the beginning of instruction. This study investigates the effects of two kinds of student background information, prior mathematics achievement and motivational level toward mathematics, on teacher planning.

Information on both student prior mathematics achievement and motivational level toward mathematics is gathered prior to the start of instruction. It should be said that participating teachers are given either both types of information or no information at all. In this way, variability in student information is manipulated.

Teacher Preinstructional Planning

The variable Teacher Preinstructional Planning is assessed using written daily lesson plans which teachers are asked to complete while instruction is taking place.

All written lesson plans are coded for instances of teacher statements in each of the following categories (categories are adapted from Zahorik, 1975; Peterson, Marx & Clark, 1978).

Objectives (Large Group) - statements about goals, aims, outcomes or purposes of instruction for the entire class.

Objectives (Individual or Small Group) - statements about goals, aims, outcomes or purposes of instruction for specific individuals or small groups.

Content (Large Group) - statements referring to the whole class which deal with information found in curriculum materials, or principles and concepts which are clearly derived from curriculum materials.

Content (Individual or Small Group) - statements referring to individuals or small groups which deal with information found in curriculum materials, or principles and concepts which are clearly derived from curriculum materials.

Activities (Large Group) - statements about the type of learning activity or experience to be used with the entire class.

Activities (Individual or Small Group) - statements about the type of learning activity or experience to be used with specific individuals or small groups.

Instruction (Large Group) - statements about teacher verbal and non-verbal behaviors and teaching strategies to be used with the whole class.

Instruction (Individual or Small Group) - statements about teacher verbal and non-verbal behaviors and teaching strategies to be used with specific individuals or small groups.

Organization - statements about how to arrange the teaching/ learning environment such as grouping of students, use of space, use of time.

Materials (Large Group) - statements about resources to be used for the whole class.

Materials (Individual or Small Groups) - statements about resources to be used for specific individuals or small groups.

Diagnosis (Large Group) - statements about whole class readiness for the particular lesson or session. These would include statements dealing with learning of prerequisites, ability, motivation and interests.

Diagnosis (Individual or Small Group) - statements about individual student or small group readiness for the particular lesson or session. These would include statements dealing with individual student or small group learning of prerequisites, individual student or small group ability, individual student or small group motivation and individual student or small group interests.

Use of Evaluation Procedures (Large Group) - statements about how to determine the effectiveness of the lesson or session for the whole class.

Use of Evaluation Procedures (Individual or Small Group) - statements about how to determine the effectiveness of the lesson or session for specific individuals or small groups.

Alternative Procedures (Large Group) - statements about possible alternative teaching strategies, activities, materials which might be used with the whole class.

Alternative Procedures (Individual or Small Group) - statements about possible alternative teaching strategies, activities, materials which might be used with specific individuals or small groups.

It is expected the effective planner frequently considers student interests and aptitudes in the utilization of instructional procedures from both whole class and individual student perspectives. Also, it is expected the effective planner frequently considers individual rather than whole class needs and interests. As such, scaling of planning categories is accomplished at two levels: (a) between categories and (b) within categories. Separate categories are first scaled as to their relative importance in regard to the determination of an effective planner, in relation to the hypotheses of the study. Subcategories are then scaled similarly. For example, the category Diagnosis is expected to be more representative of effective planning than the category Materials. Hence, teacher planning statements which reflect diagnosis are given higher scores than statements reflecting what materials should be used. However, statements labeled as Materials (Individual or Small Group) are given higher scores than statements labeled Materials (Large Group).

Planning categories and points given to each statement rated as falling into that category are given below:

1 Point

Content (Large Group)
 Activity (Large Group)
 Instruction (Large Group)
 Materials (Large Group)
 Organization

3 Points

Objectives (Large Group)
 Diagnosis (Large Group)
 Evaluation (Large Group)
 Alternative Procedure (Large Group)

2 Points

Content (Ind/Sm Group)
 Activity (Ind/Sm Group)
 Instruction (Ind/Sm Group)
 Material (Ind/Sm Group)

4 Points

Objectives (Ind/Sm Group)
 Diagnosis (Ind/Sm Group)
 Evaluation (Ind/Sm Group)
 Alternative Procedure (Ind/Sm Group)

Suppose, for example, a teacher's written plan for the day showed the following distribution of statements for the above categories:

<u>Category</u>	<u>Frequency</u>
Activity (Large Group)	3
Instruction (Large Group)	4
Materials (Large Group)	2
Diagnosis (Ind/Sm Group)	1

That teacher's raw planning score for the day would be computed as follows:

$$(3 \times 1) + (4 \times 1) + (2 \times 1) + (1 \times 4) = 13$$

Effective planners are defined as having higher raw planning scores. However, a problem exists in that not all teachers are identical in the total number of planning statements they write. Consequently, an alternative method of calculating the teacher's planning score is dividing the raw planning score by the total number of planning statements made. The number which results take into account planning differences in terms of total number of written statements, and so is a more accurate reflection of planning quality.

A description of lesson plan rater training, rater reliability and actual frequencies of planning statements obtained for each teacher are given in Appendix D.

Motivation Strategies Given

The variable Motivation Strategies Given in a dichotomous manipulated variable in that some teachers are given motivation strategies which may be used and other teachers are not. Motivation strategies given to teachers include grouping of students, (e.g., grouping to facilitate cooperation), the use of games/puzzles, and teacher directed competition among students.

Motivation Strategies Observed

The variable Motivation Strategies Observed is assessed by live classroom observation. Three categories of observed motivation strategies are coded for each student observed: (a) small grouping; (b) games/puzzles; (c) teacher-directed student

competition. Teacher scores for the variable will be obtained by computing a proportion of instances each motivation strategy is observed. Proportions are used to adjust for class length differences.

Observed Teacher Clarity

The variable Observed Teacher Clarity is assessed using live classroom observation. With the exception of the category "other," each category of teacher behavior used to assess teacher clarity is given equal weight in obtaining an overall Observed Teacher Clarity Score for each teacher. Each observed instance of one of the teacher behaviors, outlining objectives, explaining what to do next, review/summarize, relating content, repeating question or explanation, emphasizing important points is counted twice compared to the category "other."

As an example of scoring, suppose a teacher was observed having the following distribution of verbal behaviors:

<u>Category</u>	<u>Frequency</u>
Outlines	2
Reviews/Summarizes	1
Repeats Question/Explanation	1
Other	15

The teacher's raw observed clarity score would be computed as follows:

$$(2 \times 2) + (1 \times 2) + (1 \times 2) + (15 \times 1) = 23$$

However, since all classes were not identical in length, a proportion of behavior occurrence is calculated by dividing the teacher's raw score by the total number of cycles observed that day. As such, class length is adjusted for. Descriptions of teacher behavior variable, their frequency of occurrence, and observer frequencies used in obtaining reliability estimates are given in Appendix C.

Student Perception of Teacher Clarity

Student Perception of Teacher Clarity is assessed using a 32-item Likert-type scale which gives an index of student perception of teacher clarity. Higher scores indicate students perceive teachers as more clear.

Student Engaged Time

The variable Student Engaged Time is assessed by classroom observation. A measure of engaged time is obtained for each student observed. Again, due to differences in class length, engaged time scores are computed by dividing observed frequencies by total cycles observed.

Student Achievement

A measure of Student Achievement is obtained by giving an achievement test appropriate to the topic to all students at the end of instruction.

APPENDIX C

1. Observer's Manual
2. Observer Agreement Tables
3. Observed Teacher/Pupil Behavior
Frequency Tables
4. Mean Percentages of Classroom
Behavior (Across Days)

OBSERVER'S MANUAL

TEACHER PLANNING STUDY

1979

(Note: This manual was adapted from one which was prepared for a research project done by the Mathematics Education Research Group, Wisconsin Research and Development Center for Individualized Schooling)

TABLE OF CONTENTS

	Page
I. Overview of the Observation System	1
II. Outline of Observation Categories and Schedule	4
III. General Procedures for Observation	9
IV. Explanation of Observation Categories	14
Teacher Categories	14
Student Categories	16
Organizational Categories	18
Classroom Data Categories	20
V. Checklist for Coding-Error Control	22

PREFACE

A classroom is a very complex environment. At any one moment, any number of more than 30 people might be speaking about a whole range of topics. Teachers and students have identifiable roles and yet these roles change with different content and in different situations.

In an attempt to find out what sorts of verbal interactions take place in the classroom during a mathematics lesson and the extent to which students are engaged in learning mathematics in different environments, observers focus on eight sample students and their teacher and record information about the classroom on a specially coded sheet. Only one student and the teacher are observed at any one time.

The purpose of this manual is two fold. First, it is designed to introduce observers to the observation system during the training sessions. Second, it is to be used by observers as a reference for the various categories while making classroom observations.

Section II is an outline of the observation categories. This, and the checklist for coding, given in Section V, provide a quick reference for the observer in the field. Before each day of observation, the observer should review the descriptions of each category and the distinctions between the categories. Immediately following each observation, it is the responsibility of the observer to go over the checklist for coding to be sure the coding form is

completed accurately.

This manual was written to cover situations that occur in teaching. If a situation arises that is not explicitly covered in this manual, the observer will have to make the decision on how best to code the activity. As a rule of thumb, give the student the benefit of the doubt and code engaged whenever possible rather than off-task.

OBSERVER'S MANUALI. Overview of the Observation System

PURPOSE. Central to the model of classroom learning under investigation is the component of time-on-task, or engaged time. In this model, student outcomes are linked with instructional environment by means of this component. That is, teacher behaviors affect student outcomes through student behaviors, in particular, when the student is actually engaged in on-task activities. The general purpose of the observation system is to provide a measure of engaged time by observing eight sample "target" students, as well as a description of certain teacher verbal behaviors thought to be related to the amount of time students are actually engaged.

The observation system has been adapted from one developed by the Far West Laboratory which was used in the Beginning Teacher Evaluation Study to describe student activities and interactions. The system has been adapted to provide for judgments of whether or not the student is on or off-task for any particular classroom behaviors to be sampled.

The most important feature of target pupil activity to be observed is the student's engagement (engaged or off-task). Also to be observed are certain aspects of the classroom organizational environment including the particular grouping the target student

is in (i.e., individual, small, large), target student involvement with games and puzzles appropriate to the topic being taught, and the teacher's use of competition in the classroom.

The teacher behaviors to be monitored are verbal interactions with students thought to be indicative of teacher clarity of presentation.

OBSERVATION PROCEDURES. A "target population" of eight students from the group will be observed. The names of the target students, selected at random from the group, will be given to each observer prior to the first observation. The target students will remain the same for the duration of the study. The general procedure for using the observation system is one of "time-sampling." This means that each target student will not be observed continuously, but rather, in a particular sequence at different moments during the observation period. The sequence is determined by the observer before the observations begin and is maintained for the complete class period. The teacher is observed simultaneously with each target student. Seating arrangement and grouping are some considerations to make in determining the sequence. The sequence can be changed for each new observation period. The observation of all eight students and the teacher eight times compose a cycle, approximately four minutes long. It is estimated that thirty seconds are needed: (1) to observe the activity that each student is involved with, (2) to observe the teacher, and (3) to code the appropriate categories on the coding form. The behavior to be

coded consists of only those things that the student and teacher are doing precisely at the beginning of the thirty-second interval. This procedure is designed to minimize the possibility of observer bias in sampling the moments. Thus, the thirty seconds used to record information sampled at the beginning of the interval for each target student and the teacher, constitutes a complete cycle. Different codes are used to record a description of the event happening at the one moment in time to any target student and the teacher. The collection of codes from several moments will provide a series of "snap shots" of what the observed students and teacher do during the observation period.

The beginning and ending of the observation period coincide with the beginning and ending of the time period allocated to mathematics, although it would be wise to spend a minute or two at the first of the period to get a "feel" for the class. It is very likely that the students will be involved in some transitional activity or other content area at the very beginning or ending of the period. These activities are not to be coded, although the time is counted when the time class begins is recorded. If the period is not fixed and depends upon when work in another content area stops or begins, the observation period begins when the teacher redirects the students to mathematics and ends when the teacher redirects the students to some other area.

Immediately following the observation period or as soon as is practical, classroom data are recorded and the observation form

checked. This information and the coding are reviewed for any inconsistencies. It is essential that all categories coded for a single event (one sample moment) be interrelated.

II. Outline of Observation Categories

The following is a list of the observation categories to be used with very brief descriptions of each. This outline is to be used only for an initial overview and for quick reference. Complete explanations of these categories appear later in this manual.

TEACHER BEHAVIOR CATEGORIES

Outlines Lesson Structure - Refers to any verbal teacher statement which tells what the sequence of activities for the day will be.

Explains What Students Will Do Next - Refers to teacher verbalizations which tell students what they should be doing or will be doing next.

Review and/or Summarizes - Refers to teacher statements which summarize or review content previously covered.

Relates Present Content to Past and/or Future - Relate present content to past and/or future refers to any teacher verbalization in which mention of present content with regard to past and/or future content is made.

Repeats Question or Explanation When Students Seem Not to Understand - Refers to a question or explanation repeated by the teacher due to the fact that students are having difficulty understanding.

Emphasizes Important Points - Refers to any teacher statement which indicates special importance with regard to either content

or directions.

Other - Refers to any teacher statement which cannot be coded in any of the above categories.

PUPIL BEHAVIOR CATEGORIES

Absent - Target student is absent during the observation period.

Engaged - The student is engaged in a purposeful learning activity related to specified mathematics content.

Off-task - Off-task is used to describe those periods when the student is not engaged in a task related to mathematics content. This would include socializing, daydreaming, misbehaving or aimlessly walking around the room.

Listening - Listening is used to describe those times when the target student is listening to the teacher talk about the mathematics lesson.

ORGANIZATIONAL CATEGORIES

Individual - Student is assigned to be working alone.

Small Group - Student is a part of a group of 2 to 8 students assigned to be working on the same content.

Large Group - Student is a part of a group of more than 8 students working on common content.

Games/Puzzles - The category games/puzzles is used whenever the target student is supposed to be working with a game and/or puzzle appropriate to the mathematics topic.

Competition - Competition refers to any teacher directed activity which is competitive in nature, in which the target student is involved.

CLASSROOM DATA CATEGORIES

Date - The month and the day of the month are recorded.

Time Class Starts - The time that mathematics class begins is recorded.

Time Class Ends - The time that mathematics class ends is recorded.

Time Coding Starts - The time that coding of classroom events actually begins.

Time Coding Ends - The time that coding of classroom events actually ends.

Teacher - The teacher's name is recorded.

School - The school's name is recorded.

Coder - The coder's name is recorded.

Page Number - The number of the coding page is recorded. Page numbers are recorded in the sequence in which they are completed.

CODING SCHEDULE

Although it might appear that a great amount of information must be coded, the task is not as onerous as it might appear since much of it is coded only once or twice and not necessarily during the observation period.

Below is a schedule to guide the observer when various pieces of information must be coded.

Before or After Class

Date

School

Teacher

Observer

Before Class

Time Class Starts

After Class

Time Class Ends

Page Number

Each Cycle (Topics in parentheses may or may not be coded
depending on the situation)

Student - (Absent)

(Engagement)

(Listening)

Teacher - (All content oriented teacher verbalizations)

Organization - (Grouping)

(Games/Puzzles)

(Competition)

SAMPLE CODING

An example of a situation and the manner in which it would
be coded is discussed below.

Suppose at the moment sampled, the teacher is speaking to
the whole class. The target student is paying attention. The

teacher says, "What did we do yesterday?" The coding would be:

Pupil - (Engaged)

(Listening)

Teacher - (Review/Summarize)

Organization - (Large Group)

III. General Procedures for Observation

TARGET STUDENT RECOGNITION. The names of the target students will be given to the observer prior to the first observation. The first task for the observer is to learn to identify each of the eight target students by name and face. Students will get up and move around the room, so the observer must be able to identify each target student by means other than seating location.

The designated target students are to be observed whenever possible. This may mean going from group to group. The only time eight students will not be observed is when one of the target students is absent.

FAMILIARITY WITH CLASS ORGANIZATION. The observers must be familiar with the class or unit organization before observing it. This can be done by talking with the teachers. The observer should know the beginning and ending times of the periods when instruction is given on mathematics.

AVOIDING COMMUNICATION WITH STUDENTS. Another procedure that should be followed during observation is the avoidance of communication with any students. In fact, it is usually advisable to concentrate on the observation and coding so intently that eye contact with students is avoided. Students will tend to ask observers for help with their work, or will ask about what the observer is doing. Observers will find that they do not have time

to help students and code observations simultaneously and that a student who has been given help once will expect to receive it whenever it is requested thereafter. It is less distracting to provide terse explanations of what the observer is doing, but even this presents problems when the student is not satisfied with a terse statement. The most reliable procedure is to concentrate on coding observations and avoid even eye contact with students. The routine response to any student question should be either no response or the statement that both you (the observer) and the student have work to do and should not be talking.

Outside of the classroom, it is possible to maintain a more cordial relationship with the students. However, it is extremely valuable to set the standard of no communication inside the classroom. Students will recognize and accept this distinction.

It should be noted that the avoidance of communication with students is often impossible for the purpose of conducting valid observation. For example, it may be necessary to ask a student where she/he is going to or where she/he has been.

OBSERVING STUDENTS IN DIFFERENT ROOMS. During the normal course of instruction target students may leave the room as a group or individually. The observer must be prepared for these possibilities before observation by being familiar with the normal operations of the classroom.

To determine where a target student has gone the observer can

ask the teacher, another student, or the target student. Sometimes it is possible to determine where the student has gone by listening to the directions given by the teacher. It is a good idea to ask one or more sources (especially the target student her/himself) even when the observer has prior information. This verification of prior information is especially important the first one or two times the observer is in a class.

If target students are temporarily separated and the observer has determined where each of them is and what they are doing, it is not necessary to follow and observe directly the target student activities other than those involving tasks relevant to the mathematics.

The observer is to code all events related to mathematics instruction during the observation period. If the target students go to a different location to continue or initiate work with the content area, then their presumed activities must be coded. For example, when students go to a mathematics laboratory they may spend all their time looking for materials and no time actually using the materials. This would be coded as engaged. If it is impractical to observe this activity once per cycle, then one observation near the beginning and another near the end of the period may be sufficient. Note that even with intermittent sampling for a target student, that student's assumed activity must be coded once per cycle. Teacher activities need not be coded if the teacher leaves the room.

SAMPLING MOMENTS. Target students must be observed in the same order throughout the observation period. This ordering is to be done by the observer and can take into consideration seating arrangement. However, once an order has been determined, it should not be changed. The sampling of moments should occur in approximately four minute cycles. The first sample of a moment should be near the beginning of the period allocated to the content area. The "picture" at the beginning of the observation of a target student must be the moment coded. The observer "takes a mental photograph" of that moment, then decides how it should be coded and marks the appropriate categories on the form. This kind of procedure is necessary to minimize observer bias in the sampling of moments. Distinct events often take place in a rapid sequence. The observer must be very rigid in coding the precise moment first observed to prevent confusion in determining which of several events should be coded. It is estimated that observing the moment, making a mental note, and coding will take 30 seconds. Variation from this time is acceptable. What is important is that the moment sampled is precisely coded.

INVESTIGATING THE MOMENT SAMPLED. Once the observer has sampled a moment, storing a mental photograph of that moment, then it is possible to conduct brief observations thereafter to determine what coding categories best describe that moment. That is, in order to code which category best describes a moment sampled,

it may be necessary to code that moment in the context of what immediately precedes or comes after the moment sampled. In all cases, it should be clear that the moment to be coded is the one that was sampled at the beginning of the thirty-second interval. The subsequent observations are carried out simply to determine what that moment really was.

ATTENDING TO NON-TARGET STUDENTS. It is nearly impossible to prevent target students from realizing they are the focus of the observations. The avoidance of eye contact will help to reduce the extent to which target students feel self-conscious. In addition, it is helpful to keep the observation sheet out of the view of any students. This will prevent students from reading the name of the target students written on the form. However, the best procedure for reducing target student awareness of the observation is to attend to non-target students. This can be done by asking non-target students questions and observing what materials they are using.

CYCLE DURATION. One cycle (sampling one moment for each of the eight target students and eight moments for the teacher) should require approximately four minutes. Some variability can be expected. However, if at all possible the observer should maintain a rate of 30 seconds to observe the moment, determine the appropriate categories, and mark the codes.

OBSERVATION FORM. The observation coding sheet is shown on page A-1. Information is recorded on the coding sheet by checking the appropriate boxes. The date, school, observer, teacher, the time class starts and the time coding starts are recorded at the top of the page before beginning the observation. The time class ends and the time coding ends are to be recorded after the observation period. The page number is recorded as new pages are used during the period.

Events are coded in the columns within the boxes for each target student. On one coding page five events can be coded for each target student. Each cycle then consists of the observer filling out one column for each student and the teacher. The number of events must be the same for each target student. This may mean that less than 30 seconds per student will be used to observe the last few students during the final cycle of the observation period.

CHECKLIST. At the end of the observation period, the observer should refer to the checklist for coding-error control (see Section V of this manual). In addition to completing all information, the observer should review this checklist and his/her coding form, looking for coding errors. For example, the observer should check to see that an equal number of events are coded for each student on each coding sheet.

IV. Explanation of Observation Categories

In the course of coding a sample moment in a classroom, a question occasionally might arise regarding the proper categorization of an event. For example, if a student is seemingly staring into space, one might wonder whether to code the student as engaged in thinking about the content or as off-task. Similarly, if a teacher simultaneously relates some content to the past and summarizes that content, the coder might wonder which to code. In order to ensure high inter-observer agreement on coding, certain ground rules are established and stated in the following section. Where categories are more thoroughly defined most of these conventions follow naturally from what an observer's common sense might dictate. A few are arbitrary decisions.

TEACHER CATEGORIES

Teacher verbal interaction categories are coded any time the teacher is speaking at the moment sampled for a target student. The interaction can be with any student not necessarily the target student being sampled.

The category outlines lesson structure refers to any statement the teacher makes which tells what the sequence of activities for the day will be. For example, if the teacher were to say, "Today I will talk to the whole class for a few minutes and then you will work alone" would be coded outlining lesson structure.

Explains what student will be next refers to any teacher statement which tells students what they will be doing next.

Example of explains what students will do next might include "After you have finished your assignment, go on to the next page" or "Tomorrow you will be doing the same thing."

Review and/or summarize refers to teacher statements which summarize or review content previously covered. Statements such as "Today we learned about adding two fractions together" would be coded review and/or summarize. It is a good bet that statements coded as review and/or summarize will be observed close to the beginning or close to the end of the observational period.

Relates present content to past and/or future refers to any statement the teacher makes which attempts to show how the present content is related to what has already been taught or what will be taught. Examples of relating present content to past and/or future content might include "Remember when we did that yesterday" or "We will use this later when we learn how to divide."

Repeats question or explanation when students seem not to understand is coded anytime the teacher repeats a particular question or explanation due to the fact that students are having difficulty understanding. An example would be the teacher repeating a question after no one has responded to the original one.

Emphasizes important points refers to any teacher statement which indicates special importance with regard to either content, or directions for doing the content. Such statements may take the form "It's very important that you know how to multiply decimals" or "Please make sure your name is at the top of the paper."

Other refers to any teacher statement related to the content being taught which cannot be coded in any of the above categories.

Finally, it is necessary to understand that only one of the above categories can be coded at any one time. Any time an observer is in doubt as to which category is most appropriate, a judgment must be made.

STUDENT CATEGORIES

Absent. This is used to indicate that the target student is not at school, or is otherwise unavailable to be observed. Absence can be verified by checking with the teacher. A brief trip to the washroom or water fountain is not coded as absence, but, rather, as off-task activity. Do not replace an absent target student with another student during the observation period. Continue to code the target student as being absent for each cycle.

Engaged/Off-Task. The most important information obtained by coding of pupil activity is the engagement or lack of engagement of the student when working in the content area. That is, the crucial information to be obtained is the determination of whether or not the student is actually performing the mathematics

task. If the student is engaged in the content or directions related to carrying out the content of the event, then engaged is coded. If the student is not engaged in either the direction or content of the event, then off-task is coded.

The determination of engagement or non-engagement is central to the coding of pupil behavior, because this distinction is the most important of those involved in the pupil behavior categories. Whenever there is ambiguity regarding student engagement, the observer should give the student the benefit of the doubt and code an engaged learner move. Off-task should be coded only when it is reasonably clear that the target student is not engaged in the mathematics task of the event coded.

Several rules are necessary for the coding of engagement. If the target student is engaged in an activity from the content area, this is coded even though the student may not be engaged in some other activity that has been assigned by the teacher. Engagement in the content area has priority. If the student displays both a non-engaged and an engaged behavior for the same program activity, then the engaged behavior is coded. For example, the student might listen to the teacher's explanation or directions while sharpening a pencil. In such cases the engagement of listening to the teacher is coded.

If the target student is not engaged in a mathematics activity, then this non-engagement is coded even when the student is engaged

has several options makes it difficult to code either engaged or off-task until after the student selects one of those options.

It should be emphasized that off-task as defined above does not necessarily imply any bad behavior on the part of the target student. Off-task as defined above is only used to indicate a target student's lack of involvement with the ongoing mathematics activity.

Listening to Teacher. Whenever the target student is listening to anything the teacher is saying related to the mathematics lesson at the moment sample, listening to teacher is coded. It is important to understand that the target student can only be coded as listening if he/she is also engaged. Anytime the target student is listening to the teacher say something not related to the mathematics lesson, the target student would not be coded as listening. For example, suppose the teacher were to say "Today I will be handing out your science books at the end of the period." Even though the target student may be paying close attention, he/she is not coded as listening since the teacher statement is not related to the mathematics lesson. As indicated before, the target student in such an instance would be coded off-task.

ORGANIZATIONAL CATEGORIES

Grouping

The grouping categories designate the size of group the target student is working with. In order for the target student to be coded as working in a group, the members of the group must

be; (1) in close proximity, (2) working on the same materials and content, and (3) have the opportunity to interact with one another. It is not necessary for the teacher to designate the group, although this is one means of identifying whether or not a target student is a member of the group.

Working groups may change during the instructional period. One student may begin the period working alone and then go ask another student for help. The two students may work together for a while and then return to their individual work. The observer must be aware of with whom the target student is working and code the grouping as it changes. The students cannot be assumed to continue in the same groupings for the entire period.

The grouping for a target student who is off-task should be coded as the grouping the student should be in if he/she were on task. If students are to be working individually and the target student is talking with another student about a television show, then individual is coded for the grouping and off-task is coded for the learner move.

Individual. This category designates that the student is assigned to be working on his/her own task. Seatwork where the student has his/her own material is coded as individual work.

This is true even if the total group is doing the same activity.

Small Group. A small group is defined as a group with two to eight students. Some interaction within the group is normally expected. Mere proximity is not enough to define a small group.

in an alternative activity other than from the content area. The teacher could tacitly accept the off-task activity of the student. For example, a teacher might interrupt a student's mathematics seatwork to ask about the outcome of a baseball game played the day before. In this case, the student is coded as off-task. The teacher's obvious acceptance of this socializing does not change its off-task characteristics in relationship to the ongoing mathematics. Note that the coding is exactly the same if another student interrupts the target student to ask about the baseball game. Also, a student being corrected by the teacher for disruptive behavior is coded as off-task.

The off-task code is used in some cases where the teacher overtly states that the student may leave a mathematics activity temporarily for some other purpose. The off-task code would be used here when it is clear that the mathematics task is still considered ongoing and will be resumed again soon. For example, a student may leave the room to get a drink or to use the restroom during an ongoing mathematics activity. This is coded as off-task even when the teacher tells the student (overtly) that he/she may leave to get a drink or use the restroom. In some cases the determination of which assignment has been designated may become complicated. This will often be true when the teacher states that the students should work on any one of several tasks after finishing a mathematics assignment. The fact that the student

Large Group. A large group is defined as any group of students with more than eight students. Large group activities are often lectures, group discussions, flash card exercises, or recitation periods. The teacher is usually in charge and providing the direction for the group.

Games/Puzzles/Competition

The category games/puzzles is coded whenever the target student is involved in a game or puzzle appropriate to the mathematics lesson at the time sampled. It is not necessary that the target student be engaged at the moment sampled for the category games/puzzles to be coded. The category games/puzzles represent, as do the grouping categories, the ongoing activity in which the target student is supposed to be involved. As such, even though the target student may be off-task while playing a game or working a puzzle at the moment sampled, the category games/puzzles would still be coded.

The category competition is coded whenever the target student is involved in some form of teacher directed competitive activity. Such competition may be evident in two different forms: (1) intergroup and (2) intragroup. Intergroup competition will generally take the form of games in either a large or small group situation. In contrast, examples of intragroup competition might include competitive exercises done on the blackboard in which different rows compete.

As an example, if the target student is involved in playing a game appropriate to the mathematics topic at the moment sampled, then both of the categories games/puzzles and competition would be coded. If, however, the target student is engaged in doing a puzzle at the moment sampled, then only the category games/puzzles would be coded.

CLASSROOM DATA CATEGORIES

Only one item needs to be mentioned here; that being the difference between class time and coding time. It will often be the case that five minutes or more may be spent at the beginning of the mathematics period taking care of managerial functions (e.g., passing out papers, receiving milk money, waiting for student to get materials, etc.) rather than working on actual content. The observer should not begin coding until mathematics instruction has actually started. Similarly, coding should stop when mathematics instruction stops. As such, it can easily be seen that the time class is in session is not necessarily the time in which mathematics instruction is taking place; that is, the time class starts is not necessarily the time coding starts and the time class ends is not necessarily the time coding ends. The observer should limit coding to only times when mathematics instruction is taking place.

V. Checklist for Coding-Error Control

Check each at the end of the observation period.

A. Accurate completion of identification information.

1. Date of Observation
2. School
3. Teacher
4. Observer
5. Page Number

B. Accurate completion of classroom data.

1. Time Class Started
2. Time Class Ended
3. Time Coding Started
4. Time Coding Ended

C. Accurate completion of event coding.

1. Equal number of events per student per page.
2. For any mathematics event, each of the following must be coded: student - engagement. Organization - grouping.
3. Only one category is coded in teacher field (fields are divided by heavy horizontal lines). Student listening can only be coded when the student is engaged. For each event, only one of individual, small or large may be coded for student grouping. Games/puzzles and competition may be coded simultaneously.

OBSERVATION SCHEDULE FOR TEACHER PLANNING STUDY

Teacher: _____

School: _____

Coder: _____

Date: _____

Time Class Starts: _____

Time Class Ends: _____

Time Coding Starts: _____

Time Coding Ends: _____

	Student 1	Student 2	Student 3	Student 4	Student 5	Student 6	Student 7	Student 8
Teacher	Outlines							
	Explains							
	Rev/Sum							
	Rel. Content							
	Repeats Q/I							
	Emph. I. P.							
Student	Other							
	Aligned							
	Engaged							
	Off-task							
	Listening							
	Individual							
Organ.	Small							
	Large							
	Games/Puz.							
	Competition							

Page Number: _____

Table A
 Observer Frequencies for Teacher/Pupil Behavior
 and Classroom Organization by Student for Class 1 (Day 1)

Category/observer	Student							
	1	2	3	4	5	6	7	8
Outlines objectives								
Observer 1	1	0	0	0	0	0	0	0
Observer 2	1	0	0	0	0	0	0	1
Explains what to do next								
Observer 1	0	1	2	0	1	1	0	1
Observer 2	0	0	2	1	0	2	1	0
Reviews/summarizes								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	1	1	1	0	0	0	0	0
Relates content								
Observer 1	0	1	0	0	0	0	0	0
Observer 2	0	1	0	0	0	0	0	0
Repeats question/explanation								
Observer 1	1	2	0	0	1	0	0	0
Observer 2	2	4	2	2	2	5	4	3
Emphasizes important point								
Observer 1	0	0	1	0	0	0	0	0
Observer 2	1	0	1	1	0	0	0	1

Table A (continued)

Category/observer	Student							
	1	2	3	4	5	6	7	8
Other								
Observer 1	5	5	6	6	6	7	7	4
Observer 2	4	3	4	5	7	2	3	4
Engaged								
Observer 1	10	10	9	9	9	7	9	9
Observer 2	10	10	9	10	9	8	9	8
Off-task								
Observer 1	0	0	1	1	1	3	1	1
Observer 2	0	0	1	0	1	2	1	2
Listening								
Observer 1	6	6	6	5	6	6	5	5
Observer 2	7	7	6	7	7	6	7	5
Individual								
Observer 1	3	3	3	3	3	2	3	3
Observer 2	3	2	3	3	3	2	2	3
Small								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0
Large								
Observer 1	7	7	7	7	7	8	7	7
Observer 2	7	8	7	7	7	8	8	7

Table A (continued)

Category/observer	Student							
	1	2	3	4	5	6	7	8
Games/puzzles								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0
Competition								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0

Table B
 Observer Frequencies for Teacher/Pupil Behavior
 and Classroom Organization by Student for Class 1 (Day 2)

Category/observer	Student							
	1	2	3	4	5	6	7	8
Outlines objectives								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0
Explains what to do next								
Observer 1	1	1	1	0	0	0	0	0
Observer 2	1	1	1	0	0	0	0	0
Reviews/summarizes								
Observer 1	4	3	3	2	4	2	1	1
Observer 2	4	2	3	2	4	2	1	1
Relates content								
Observer 1	0	0	0	0	0	1	0	0
Observer 2	0	0	0	0	0	1	0	0
Repeats question/explanation								
Observer 1	0	0	0	1	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0
Emphasizes important point								
Observer 1	0	0	0	0	0	0	0	1
Observer 2	0	0	0	0	0	0	0	0

Table B (continued)

Category/observer	Student							
	1	2	3	4	5	6	7	8
Other								
Observer 1	1	1	2	1	1	2	3	3
Observer 2	1	3	2	2	1	1	3	4
Engaged								
Observer 1	7	7	7	7	7	7	7	7
Observer 2	7	7	7	7	7	7	7	7
Off-task								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0
Listening								
Observer 1	6	5	6	4	5	4	3	4
Observer 2	6	5	6	5	5	5	3	4
Individual								
Observer 1	1	0	0	1	2	2	2	2
Observer 2	1	0	0	1	2	2	2	2
Small								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0
Large								
Observer 1	6	7	7	6	5	5	5	5
Observer 2	6	7	7	6	5	5	5	5

Table B (continued)

Category/observer	Student							
	1	2	3	4	5	6	7	8
Games/puzzles								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0
Competition								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0

Table C
 Observer Frequencies for Teacher/Pupil Behavior
 and Classroom Organization by Student for Class 2 (Day 1)

Category/observer	Student							
	1	2	3	4	5	6	7	8
Outlines objectives								
Observer 1	0	0	0	0	0	-	0	0
Observer 2	0	0	0	0	0	-	0	0
Explains what to do next								
Observer 1	0	0	0	0	0	-	0	0
Observer 2	0	0	1	0	0	-	0	0
Reviews/summarizes								
Observer 1	0	0	0	0	0	-	0	0
Observer 2	0	0	0	0	0	-	0	0
Relates content								
Observer 1	0	0	0	0	0	-	0	0
Observer 2	0	0	0	0	0	-	0	0
Repeats question/explanation								
Observer 1	0	0	0	0	0	-	1	0
Observer 2	0	0	0	0	0	-	0	0
Emphasizes important point								
Observer 1	0	0	1	0	0	-	0	0
Observer 2	0	0	0	0	0	-	0	0

Table C (continued)

Category/observer	Student							
	1	2	3	4	5	6	7	8
Other								
Observer 1	8	7	6	6	8	-	5	7
Observer 2	5	5	4	5	5	-	4	4
Engaged								
Observer 1	6	6	6	5	9	-	7	7
Observer 2	6	6	5	4	9	-	6	6
Off-task								
Observer 1	3	3	3	4	0	-	2	2
Observer 2	3	3	4	5	0	-	3	3
Listening								
Observer 1	4	3	5	3	4	-	3	4
Observer 2	4	5	4	3	4	-	3	2
Individual								
Observer 1	4	4	4	5	5	-	5	5
Observer 2	4	4	4	4	4	-	5	5
Small								
Observer 1	0	0	0	0	0	-	0	0
Observer 2	0	0	0	0	0	-	0	0
Large								
Observer 1	5	5	5	4	4	-	4	4
Observer 2	5	5	5	5	5	-	4	4

Table C (continued)

Category/observer	Student							
	1	2	3	4	5	6	7	8
Games/puzzles								
Observer 1	0	0	0	0	0	-	0	0
Observer 2	0	0	0	0	0	-	0	0
Competition								
Observer 1	0	0	0	0	0	-	0	0
Observer 2	0	0	0	0	0	-	0	0

Table D

Observer Frequencies for Teacher/Pupil Behavior
and Classroom Organization by Student for Class 2 (Day 2)

Category/observer	Student							
	1	2	3	4	5	7	6	8
Outlines objectives								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0
Explains what to do next								
Observer 1	0	0	1	1	2	0	0	1
Observer 2	1	0	1	1	3	0	1	1
Reviews/summarizes								
Observer 1	0	0	0	1	0	0	0	0
Observer 2	0	0	0	1	0	0	0	0
Relates content								
Observer 1	0	1	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0
Repeats question/explanation								
Observer 1	0	0	1	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0
Emphasizes important point								
Observer 1	0	0	0	0	1	0	1	0
Observer 2	0	0	0	0	1	0	1	1

Table D (continued)

Category/observer	Student							
	1	2	3	4	5	6	7	8
Other								
Observer 1	9	6	6	7	5	4	8	7
Observer 2	8	8	7	7	4	5	7	6
Engaged								
Observer 1	9	9	10	8	9	9	4	6
Observer 2	8	9	10	7	8	9	4	6
Off-task								
Observer 1	1	1	0	2	1	1	6	4
Observer 2	2	1	0	3	2	1	6	4
Listening								
Observer 1	2	1	2	3	6	4	2	2
Observer 2	2	1	2	3	4	4	2	3
Individual								
Observer 1	7	8	8	7	0	0	8	8
Observer 2	7	8	8	7	0	0	8	8
Small								
Observer 1	0	0	0	0	8	8	0	0
Observer 2	0	0	0	0	8	8	0	0
Large								
Observer 1	3	2	2	3	2	2	2	2
Observer 2	3	2	2	3	2	2	2	2

Table D (continued)

Category/observer	Student							
	1	2	3	4	5	6	7	8
Games/puzzles								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0
Competition								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0

Table E
Observer Frequencies for Teacher/Pupil Behavior
and Classroom Organization by Student for Class 3 (Day 1)

Category/observer	Student							
	1	2	3	4	5	6	7	8
Outlines objectives								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0
Explains what to do next								
Observer 1	1	1	0	0	0	0	0	1
Observer 2	1	1	0	0	0	0	0	0
Reviews/summarizes								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0
Relates content								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0
Repeats question/explanation								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0
Emphasizes important point								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	1	0	0	0	0

Table E (continued)

Category/observer	Student							
	1	2	3	4	5	6	7	8
Other								
Observer 1	6	5	7	5	4	3	5	5
Observer 2	5	3	6	3	4	4	5	5
Engaged								
Observer 1	8	7	8	8	7	4	7	6
Observer 2	8	7	8	8	7	5	8	5
Off-task								
Observer 1	1	2	1	1	2	5	2	3
Observer 2	1	2	1	1	2	4	1	4
Listening								
Observer 1	2	2	3	1	0	0	1	1
Observer 2	2	2	2	1	0	0	0	2
Individual								
Observer 1	4	4	4	4	9	8	8	8
Observer 2	4	4	4	4	9	8	8	8
Small								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0
Large								
Observer 1	5	5	5	5	0	1	1	1
Observer 2	5	5	5	5	0	1	1	1

Table E (continued)

Category/observer	Student							
	1	2	3	4	5	6	7	8
Games/puzzles								
Observer 1	4	4	4	4	0	0	0	0
Observer 2	4	4	4	4	0	0	0	0
Competition								
Observer 1	3	3	3	3	0	0	0	0
Observer 2	3	3	3	3	0	0	0	0

Table F
Observer Frequencies for Teacher/Pupil Behavior
and Classroom Organization by Student for Class 3 (Day 2)

Category/observer	Student							
	1	2	3	4	5	6	7	8
Outlines objectives								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0
Explains what to do next								
Observer 1	1	2	1	0	0	0	1	1
Observer 2	0	2	1	0	0	0	0	0
Reviews/summarizes								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0
Relates content								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0
Repeats question/explanation								
Observer 1	0	1	1	0	0	0	0	0
Observer 2	0	0	1	0	0	0	0	0
Emphasizes important point								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0

Table F (continued)

Category/observer	Student							
	1	2	3	4	5	6	7	8
Other								
Observer 1	4	3	3	4	5	5	5	3
Observer 2	5	4	4	4	5	5	6	3
Engaged								
Observer 1	10	9	10	10	7	8	9	9
Observer 2	10	9	10	10	7	8	8	8
Off-task								
Observer 1	0	1	0	0	3	2	1	1
Observer 2	0	1	0	0	3	2	2	2
Listening								
Observer 1	3	4	3	1	1	1	2	1
Observer 2	3	4	3	1	1	1	1	0
Individual								
Observer 1	5	5	5	6	6	6	6	6
Observer 2	5	5	5	6	6	6	6	6
Small								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0
Large								
Observer 1	5	5	5	4	4	4	4	4
Observer 2	5	5	5	4	4	4	4	4

Table F (continued)

Category/observer	Student							
	1	2	3	4	5	6	7	8
Games/puzzles								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0
Competition								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0

Table G
Observer Frequencies for Teacher/Pupil Behavior
and Classroom Organization by Student for Class 4 (Day 1)

Category/observer	Student							
	1	2	3	4	5	6	7	8
Outlines objectives								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0
Explains what to do next								
Observer 1	0	0	0	1	0	0	1	0
Observer 2	0	0	1	1	0	1	0	0
Reviews/summarizes								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0
Relates content								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0
Repeats question/explanation								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0
Emphasizes important point								
Observer 1	0	0	0	0	0	1	0	0
Observer 2	0	0	0	0	0	0	0	0

Table G (continued)

Category/observer	Student							
	1	2	3	4	5	6	7	8
Other								
Observer 1	3	5	6	4	8	6	6	5
Observer 2	3	2	3	4	2	2	6	3
Engaged								
Observer 1	7	9	6	9	5	7	7	6
Observer 2	8	9	6	9	6	5	7	7
Off-task								
Observer 1	2	0	3	0	4	2	2	3
Observer 2	1	0	3	0	3	4	2	2
Listening								
Observer 1	1	2	4	3	3	4	4	2
Observer 2	3	2	4	4	1	3	4	2
Individual								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0
Small								
Observer 1	5	5	5	5	5	6	5	5
Observer 2	6	5	5	5	6	5	5	6
Large								
Observer 1	4	4	4	4	4	3	4	4
Observer 2	3	4	4	4	3	4	4	3

Table G (continued)

Category/observer	Student							
	1	2	3	4	5	6	7	8
Games/puzzles								
Observer 1	4	4	4	4	4	4	3	4
Observer 2	4	4	4	4	4	4	3	4
Competition								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	4	4	4	4	4	4	3	4

Table H
 Observer Frequencies for Teacher/Pupil Behavior
 and Classroom Organization by Student for Class 4 (Day 2)

Category/observer	Student							
	1	2	3	4	5	6	7	8
Outlines objectives								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0
Explains what to do next								
Observer 1	0	0	0	0	1	1	2	1
Observer 2	1	0	0	0	0	0	1	0
Reviews/summarizes								
Observer 1	1	1	1	0	0	0	0	0
Observer 2	0	1	0	0	0	0	0	0
Relates content								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0
Repeats question/explanation								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0
Emphasizes important point								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0

Table H (continued)

Category/observer	Student							
	1	2	3	4	5	6	7	8
Other								
Observer 1	3	4	1	4	1	5	3	7
Observer 2	5	4	4	4	6	6	4	7
Engaged								
Observer 1	7	7	7	7	8	8	8	8
Observer 2	8	8	7	7	7	8	7	5
Off-task								
Observer 1	1	1	1	1	0	0	0	0
Observer 2	0	0	1	1	1	0	1	3
Listening								
Observer 1	4	3	1	2	1	4	4	4
Observer 2	5	3	1	2	3	4	4	2
Individual								
Observer 1	1	1	1	1	1	1	1	2
Observer 2	1	1	1	1	1	1	1	2
Small								
Observer 1	3	3	3	4	4	3	3	3
Observer 2	3	3	4	4	4	3	3	3
Large								
Observer 1	4	4	4	3	3	4	4	3
Observer 2	4	4	3	3	3	4	4	3

Table H (continued)

Category/observer	Student							
	1	2	3	4	5	6	7	8
Games/puzzles								
Observer 1	3	3	3	4	4	3	3	3
Observer 2	3	3	3	4	4	3	3	3
Competition								
Observer 1	3	3	3	4	4	3	3	3
Observer 2	3	3	3	4	4	3	3	3

Table I
Observer Frequencies for Teacher/Pupil Behavior
and Classroom Organization by Student for Class 5 (Day 1)

Category/observer	Student							
	1	2	3	4	5	6	7	8
Outlines objectives								
Observer 1	1	1	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0
Explains what to do next								
Observer 1	1	0	1	1	0	0	0	0
Observer 2	2	1	1	0	0	0	0	0
Reviews/summarizes								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0
Relates content								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0
Repeats question/explanation								
Observer 1	1	1	1	0	1	0	0	0
Observer 2	0	1	0	0	1	0	0	0
Emphasizes important point								
Observer 1	0	0	0	1	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0

Table I (continued)

Category/observer	Student							
	1	2	3	4	5	6	7	8
Other								
Observer 1	5	7	5	6	8	6	6	7
Observer 2	6	7	7	9	7	4	7	7
Engaged								
Observer 1	9	7	10	8	7	9	8	9
Observer 2	10	8	10	8	7	9	8	10
Off-task								
Observer 1	1	3	0	2	3	1	2	1
Observer 2	0	2	0	2	3	1	2	0
Listening								
Observer 1	5	6	5	5	3	3	3	5
Observer 2	5	6	5	5	4	3	4	4
Individual								
Observer 1	4	5	5	6	6	6	5	4
Observer 2	4	4	5	5	6	6	5	4
Small								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0
Large								
Observer 1	6	5	5	4	4	4	5	6
Observer 2	6	6	5	5	4	4	5	6

Table I (continued)

Category/observer	Student							
	1	2	3	4	5	6	7	8
Games/puzzles								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0
Competition								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0

Table J
 Observer Frequencies for Teacher/Pupil Behavior
 and Classroom Organization by Student for Class 5 (Day 2)

Category/observer	Student							
	1	2	3	4	5	6	7	8
Outlines objectives								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0
Explains what to do next								
Observer 1	0	0	0	0	0	0	1	1
Observer 2	0	0	0	0	0	0	1	1
Reviews/summarizes								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0
Relates content								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0
Repeats question/explanation								
Observer 1	0	0	0	0	0	1	0	0
Observer 2	0	0	0	0	0	1	0	0
Emphasizes important point								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0

Table J (continued)

Category/observer	Student							
	1	2	3	4	5	6	7	8
Other								
Observer 1	5	7	6	4	8	6	6	6
Observer 2	5	7	6	4	8	6	6	5
Engaged								
Observer 1	9	10	9	6	6	8	4	6
Observer 2	9	9	6	6	6	7	4	6
Off-task								
Observer 1	1	0	1	4	4	2	6	4
Observer 2	1	1	4	4	4	3	6	4
Listening								
Observer 1	1	2	2	0	2	3	0	2
Observer 2	1	2	2	1	2	3	0	1
Individual								
Observer 1	8	8	8	8	8	8	0	9
Observer 2	8	8	8	8	8	8	0	9
Small								
Observer 1	0	0	0	0	0	0	10	0
Observer 2	0	0	0	0	0	0	10	0
Large								
Observer 1	2	2	2	2	2	2	0	1
Observer 2	2	2	2	2	2	2	0	1

Table J (continued)

Category/observer	Student							
	1	2	3	4	5	6	7	8
Games/puzzles								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0
Competition								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0

Table K
Observer Frequencies for Teacher/Pupil Behavior
and Classroom Organization by Student for Class 6 (Day 1)

Category/observer	Student							
	1	2	3	4	5	6	7	8
Outlines objectives								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0
Explains what to do next								
Observer 1	1	0	0	0	1	1	0	1
Observer 2	0	0	0	0	0	0	0	0
Reviews/summarizes								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0
Relates content								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0
Repeats question/explanation								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0
Emphasizes important point								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0

Table K (continued)

Category/observer	Student							
	1	2	3	4	5	6	7	8
Other								
Observer 1	4	3	1	4	5	5	2	0
Observer 2	3	2	1	3	4	5	1	1
Engaged								
Observer 1	4	6	4	5	8	7	5	7
Observer 2	5	6	5	5	8	7	5	7
Off-task								
Observer 1	4	2	4	3	0	1	3	1
Observer 2	3	2	3	3	0	1	3	1
Listening								
Observer 1	3	2	1	2	5	3	2	1
Observer 2	3	1	1	2	3	3	1	1
Individual								
Observer 1	3	4	4	3	3	3	4	4
Observer 2	3	5	4	3	3	3	4	4
Small								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0
Large								
Observer 1	5	4	4	5	5	5	4	4
Observer 2	5	3	4	5	5	5	4	4

Table K (continued)

Category/observer	Student							
	1	2	3	4	5	6	7	8
Games/puzzles								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0
Competition								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0

Table L
 Observer Frequencies for Teacher/Pupil Behavior
 and Classroom Organization by Student for Class 6 (Day 2)

Category/observer	Student							
	1	2	3	4	5	6	7	8
Outlines objectives								
Observer 1	0	0	0	-	0	0	0	0
Observer 2	0	0	0	-	0	0	0	0
Explains what to do next								
Observer 1	0	0	0	-	1	1	0	0
Observer 2	0	0	0	-	1	1	0	0
Reviews/summarizes								
Observer 1	0	0	0	-	0	0	0	0
Observer 2	0	0	0	-	0	0	0	0
Relates content								
Observer 1	0	0	0	-	0	0	0	0
Observer 2	0	0	0	-	0	0	0	0
Repeats question/explanation								
Observer 1	0	0	0	-	0	0	0	0
Observer 2	0	0	0	-	0	0	0	0
Emphasizes important point								
Observer 1	0	0	0	-	0	0	0	0
Observer 2	0	0	0	-	0	0	0	0

Table L (continued)

Category/observer	Student							
	1	2	3	4	5	6	7	8
Other								
Observer 1	5	3	3	-	3	2	2	4
Observer 2	5	3	3	-	3	3	3	4
Engaged								
Observer 1	8	7	7	-	9	9	7	7
Observer 2	8	7	7	-	9	9	7	7
Off-task								
Observer 1	1	2	2	-	0	0	2	2
Observer 2	1	2	2	-	0	0	2	2
Listening								
Observer 1	2	1	0	-	2	1	0	1
Observer 2	2	1	0	-	2	1	0	1
Individual								
Observer 1	4	4	3	-	4	4	5	5
Observer 2	4	4	3	-	4	4	5	5
Small								
Observer 1	0	0	1	-	0	0	0	0
Observer 2	0	0	1	-	0	0	0	0
Large								
Observer 1	5	5	5	-	5	5	4	4
Observer 2	5	5	5	-	5	5	4	4

Table L (continued)

Category/observer	Student							
	1	2	3	4	5	6	7	8
Games/puzzles								
Observer 1	0	0	0	-	0	0	0	0
Observer 2	0	0	0	-	0	0	0	0
Competition								
Observer 1	0	0	0	-	0	0	0	0
Observer 2	0	0	0	-	0	0	0	0

Table M
 Observer Frequencies for Teacher/Pupil Behavior
 and Classroom Organization by Student for Class 7 (Day 1)

Category/observer	Student							
	1	2	3	4	5	6	7	8
Outlines objectives								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0
Explains what to do next								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0
Reviews/summarizes								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0
Relates content								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0
Repeats question/explanation								
Observer 1	0	0	0	0	0	0	2	0
Observer 2	0	0	1	0	0	0	0	0
Emphasizes important point								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0

Table M (continued)

Category/observer	Student							
	1	2	3	4	5	6	7	8
Other								
Observer 1	9	8	9	7	5	6	7	6
Observer 2	9	9	9	7	7	8	7	6
Engaged								
Observer 1	8	6	8	8	5	6	6	9
Observer 2	8	8	8	7	5	5	6	6
Off-task								
Observer 1	2	4	2	2	5	4	4	1
Observer 2	2	2	2	3	5	5	4	4
Listening								
Observer 1	4	2	6	2	1	2	5	4
Observer 2	5	3	5	2	2	2	4	3
Individual								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0
Small								
Observer 1	4	6	6	6	7	7	5	5
Observer 2	4	6	5	6	7	7	5	4
Large								
Observer 1	6	4	4	4	3	3	5	5
Observer 1	6	4	5	4	3	3	5	6

Table M (continued)

Category/observer	Student							
	1	2	3	4	5	6	7	8
Games/puzzles								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0
Competition								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0

Table N
 Observer Frequencies for Teacher/Pupil Behavior
 and Classroom Organization by Student for Class 7 (Day 2)

Category/observer	Student							
	1	2	3	4	5	6	7	8
Outlines objectives								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0
Explains what to do next								
Observer 1	0	0	0	0	0	1	0	0
Observer 2	0	0	1	0	0	1	0	0
Reviews/summarizes								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0
Relates content								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0
Repeats question/explanation								
Observer 1	0	0	0	0	0	0	1	0
Observer 2	1	0	0	0	0	0	1	0
Emphasizes important point								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0

Table N (continued)

Category/observer	Student							
	1	2	3	4	5	6	7	8
Other								
Observer 1	5	5	8	3	8	4	3	6
Observer 2	4	5	7	5	5	6	4	6
Engaged								
Observer 1	4	7	7	4	7	7	7	5
Observer 2	5	6	8	6	7	7	7	5
Off-task								
Observer 1	6	3	3	6	3	3	3	5
Observer 2	5	4	2	4	3	3	3	5
Listening								
Observer 1	1	2	2	1	3	3	2	2
Observer 2	1	1	2	1	1	3	3	2
Individual								
Observer 1	8	8	8	8	6	6	5	6
Observer 2	8	8	8	8	6	6	5	5
Small								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0
Large								
Observer 1	2	2	2	2	4	4	5	4
Observer 2	2	2	2	2	4	4	5	5

Table N (continued)

Category/observer	Student							
	1	2	3	4	5	6	7	8
Games/puzzles								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0
Competition								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0

Table 0
 Observer Frequencies for Teacher/Pupil Behaviors
 and Classroom Organization by Student for Class 8 (Day 1)

Category/observer	Student							
	1	2	3	4	5	6	7	8
Outlines objectives								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0
Explains what to do next								
Observer 1	1	0	0	0	0	3	0	0
Observer 2	1	0	0	0	1	3	1	0
Reviews/summarizes								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0
Relates content								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0
Repeats question/explanation								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0
Emphasizes important point								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	1	0	0	0	0	0	0	0

Table 0 (continued)

Category/observer	Student							
	1	2	3	4	5	6	7	8
Other								
Observer 1	6	6	6	8	6	5	6	5
Observer 2	5	6	6	8	6	5	6	5
Engaged								
Observer 1	8	9	9	9	8	10	9	9
Observer 2	8	9	9	9	9	10	9	10
Off-task								
Observer 1	2	1	1	1	2	0	1	1
Observer 2	2	1	1	1	1	0	1	0
Listening								
Observer 1	6	6	6	8	6	8	5	5
Observer 2	6	4	5	7	7	8	5	4
Individual								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0
Small								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0
Large								
Observer 1	10	10	10	10	10	10	10	10
Observer 2	10	10	10	10	10	10	10	10

Table 0 (continued)

Category/observer	Student							
	1	2	3	4	5	6	7	8
Games/puzzles								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0
Competition								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0

Table P
 Observer Frequencies for Teacher/Pupil Behavior
 and Classroom Organization by Student for Class 8 (Day 2)

Category/observer	Student							
	1	2	3	4	5	6	7	8
Outlines objectives								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0
Explains what to do next								
Observer 1	0	0	0	0	1	0	0	1
Observer 2	0	0	0	0	0	0	0	1
Reviews/summarizes								
Observer 1	0	1	1	1	0	0	0	0
Observer 2	0	1	1	1	0	0	0	0
Relates content								
Observer 1	0	0	0	0	1	0	0	0
Observer 2	0	0	0	0	1	0	0	0
Repeats question/explanation								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	1	0	0
Emphasizes important point								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0

Table P (continued)

Category/observer	Student							
	1	2	3	4	5	6	7	8
Other								
Observer 1	6	6	2	4	2	3	4	5
Observer 2	6	7	3	3	3	1	4	5
Engaged								
Observer 1	9	8	9	9	8	6	7	9
Observer 2	9	8	10	9	8	6	5	8
Off-task								
Observer 1	1	2	1	1	2	4	3	1
Observer 2	1	2	0	1	2	4	5	2
Listening								
Observer 1	1	3	0	2	1	1	1	3
Observer 2	2	3	0	3	1	1	1	2
Individual								
Observer 1	10	8	9	7	8	8	8	8
Observer 2	10	9	9	7	8	8	8	8
Small								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0
Large								
Observer 1	0	2	1	3	2	2	2	2
Observer 2	0	1	1	3	2	2	2	2

Table P (continued)

Category/observer	Student							
	1	2	3	4	5	6	7	8
Games/puzzles								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0
Competition								
Observer 1	0	0	0	0	0	0	0	0
Observer 2	0	0	0	0	0	0	0	0

Table Q

Observer Frequencies for Teacher/Pupil Behavior
and Classroom Organization by Student for Class 9 (Day 1)

Category/observer	Student								
	1	2	3	4	5	6	7	8	9
Outlines objectives									
Observer 1	0	0	0	-	0	0	0	0	0
Observer 2	0	0	0	-	0	0	0	0	0
Explains what to do next									
Observer 1	0	0	1	-	1	0	0	0	0
Observer 2	0	0	2	-	1	0	0	0	0
Reviews/summarizes									
Observer 1	0	0	0	-	0	0	0	0	0
Observer 2	0	0	0	-	0	0	0	0	0
Relates content									
Observer 1	0	0	0	-	0	0	0	0	0
Observer 2	0	0	0	-	0	0	0	0	0
Repeats question/explanation									
Observer 1	0	0	0	-	0	0	0	0	0
Observer 2	0	0	0	-	0	0	0	0	0
Emphasizes important point									
Observer 1	0	0	0	-	0	0	0	0	0
Observer 2	0	0	0	-	0	0	0	0	0

Table Q (continued)

Category/observer	Student								
	1	2	3	4	5	6	7	8	9
Other									
Observer 1	6	6	6	-	6	5	3	3	3
Observer 2	6	7	5	-	6	5	3	5	2
Engaged									
Observer 1	8	9	8	-	8	9	8	8	5
Observer 2	8	8	7	-	9	9	7	8	3
Off-task									
Observer 1	2	1	2	-	2	1	2	2	5
Observer 2	2	2	3	-	1	1	3	2	7
Listening									
Observer 1	5	5	5	-	6	5	2	2	3
Observer 2	5	5	3	-	5	5	2	2	1
Individual									
Observer 1	1	1	1	-	2	2	2	2	2
Observer 2	1	1	1	-	2	2	2	2	2
Small									
Observer 1	0	0	0	-	0	0	0	0	0
Observer 2	0	0	0	-	0	0	0	0	0
Large									
Observer 1	9	9	9	-	8	8	8	8	8
Observer 2	9	9	9	-	8	8	8	8	8

Table Q (continued)

Category/observer	Student								
	1	2	3	4	5	6	7	8	9
Games/puzzles									
Observer 1	0	0	0	-	0	0	0	0	0
Observer 2	0	0	0	-	0	0	0	0	0
Competition									
Observer 1	0	0	0	-	0	0	0	0	0
Observer 2	0	0	0	-	0	0	0	0	0

Table R
Observer Frequencies for Teacher/Pupil Behavior
and Classroom Organization by Student for Class 9 (Day 2)

Category/observer	Student								
	1	2	3	4	5	6	7	8	9
Outlines objectives									
Observer 1	0	0	-	0	-	0	0	0	0
Observer 2	0	0	-	0	-	0	0	0	0
Explains what to do next									
Observer 1	0	0	-	0	-	0	1	1	0
Observer 2	0	0	-	0	-	0	1	1	0
Reviews/summarizes									
Observer 1	0	0	-	0	-	0	0	0	0
Observer 2	0	0	-	0	-	0	0	0	0
Relates content									
Observer 1	0	0	-	0	-	0	0	0	0
Observer 2	0	0	-	0	-	0	0	0	0
Repeats question/explanation									
Observer 1	0	0	-	0	-	0	0	0	0
Observer 2	0	0	-	1	-	0	0	0	0
Emphasizes important point									
Observer 1	0	0	-	0	-	0	0	0	0
Observer 2	0	0	-	0	-	0	0	0	0

Table R (continued)

Category/observer	Student								
	1	2	3	4	5	6	7	8	9
Other									
Observer 1	1	3	-	6	-	6	2	2	4
Observer 2	2	2	-	5	-	6	2	3	4
Engaged									
Observer 1	8	9	-	0	-	8	7	0	0
Observer 2	8	9	-	0	-	8	6	0	0
Off-task									
Observer 1	1	0	-	9	-	1	2	9	9
Observer 2	1	0	-	9	-	1	3	9	9
Listening									
Observer 1	1	2	-	0	-	5	2	0	0
Observer 2	2	2	-	0	-	5	2	0	0
Individual									
Observer 1	4	5	-	9	-	2	2	9	9
Observer 2	4	5	-	9	-	1	1	9	9
Small									
Observer 1	5	4	-	0	-	7	7	0	0
Observer 2	5	4	-	0	-	8	8	0	0
Large									
Observer 1	0	0	-	0	-	0	0	0	0
Observer 1	0	0	-	0	-	0	0	0	0

Table R (continued)

Category/observer	Student								
	1	2	3	4	5	6	7	8	9
Games/puzzles									
Observer 1	0	0	-	0	-	0	0	0	0
Observer 2	0	0	-	0	-	0	0	0	0
Competition									
Observer 1	0	0	-	0	-	0	0	0	0
Observer 2	0	0	-	0	-	0	0	0	0

Table S
Frequencies of Observed Teacher/Pupil Behaviors and
Organizational Activities by Class for Day 1

Behavior	Class									Total
	1	2	3	4	5	6	7	8	9	
Outlines objectives ^a	3 (3.9)	1 (1.5)	0 (0.0)	5 (6.9)	3 (9.7)	0 (0.0)	0 (0.0)	1 (1.1)	0 (0.0)	13 (2.4)
Explains what to do next ^a	6 (7.8)	0 (0.0)	2 (6.3)	20 (27.8)	4 (12.9)	0 (0.0)	5 (6.4)	3 (3.2)	2 (2.9)	42 (7.7)
Reviews/summarizes ^a	5 (6.5)	1 (1.5)	0 (0.0)	6 (8.3)	0 (0.0)	0 (0.0)	7 (9.0)	6 (6.3)	2 (2.9)	27 (5.0)
Relates content ^a	3 (3.9)	0 (0.0)	0 (0.0)	4 (5.6)	0 (0.0)	0 (0.0)	0 (0.0)	2 (2.1)	0 (0.0)	9 (1.7)
Repeats question/explanation ^a	3 (3.9)	0 (0.0)	0 (0.0)	0 (0.0)	1 (3.2)	0 (0.0)	9 (11.5)	17 (13.7)	6 (8.6)	32 (5.9)
Emphasizes important points ^a	1 (1.3)	2 (3.1)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	2 (2.5)	3 (3.2)	2 (2.9)	10 (1.8)
Other ^a	36 (72.7)	61 (93.8)	30 (93.8)	37 (51.4)	23 (74.2)	22 (100)	55 (70.5)	67 (70.5)	58 (82.9)	409 (75.5)
Engaged ^b	77 (96.3)	54 (77.1)	49 (87.5)	71 (98.6)	33 (87.5)	29 (72.5)	62 (77.5)	85 (88.5)	56 (77.3)	518 (85.5)
Off-task ^b	3 (3.8)	16 (22.9)	7 (12.3)	1 (1.4)	5 (12.5)	11 (27.5)	18 (22.3)	11 (11.5)	16 (22.2)	88 (14.5)
Listening ^a	46 (59.7)	14 (21.5)	17 (53.1)	40 (55.6)	20 (64.5)	3 (22.7)	18 (23.1)	65 (68.4)	24 (34.3)	249 (45.9)
Individual ^b	8 (10.0)	54 (77.1)	36 (64.3)	0 (0.0)	0 (0.0)	24 (60.0)	0 (0.0)	0 (0.0)	14 (19.4)	136 (22.4)
Small ^b	0 (0.0)	0 (0.0)	0 (0.0)	19 (26.4)	0 (0.0)	0 (0.0)	41 (51.3)	0 (0.0)	0 (0.0)	60 (9.9)
Large ^b	72 (90.0)	16 (22.9)	20 (35.7)	53 (73.6)	40 (100)	16 (40.0)	39 (48.3)	96 (100)	58 (80.6)	420 (67.7)
Games/puzzles ^b	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Competition ^b	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Total	283 (14.1)	219 (10.9)	161 (8.0)	256 (12.3)	131 (6.5)	107 (5.3)	256 (12.8)	352 (17.6)	238 (11.9)	

^aPercentages (in parentheses) based on total observed frequency of teacher behavior.

^bPercentages (in parentheses) based on total number of observed moments.

Table T
Frequencies of Observed Teacher/Pupil Behaviors and
Organizational Activities by Class for Day 2

Behavior	Class									Total
	1	2	3	4	5	6	7	8	9	
Outlines objectives ^a	0 (0.0)	0 (0.0)	0 (0.0)	1 (1.6)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.2)
Explains what to do next ^a	7 (9.5)	1 (2.9)	6 (12.0)	9 (14.5)	1 (1.8)	1 (4.0)	0 (0.0)	6 (11.1)	3 (7.1)	34 (7.4)
Reviews/summarizes ^a	1 (1.4)	0 (0.0)	0 (0.0)	4 (6.5)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	5 (1.1)
Relates content ^a	3 (4.1)	0 (0.0)	0 (0.0)	1 (1.6)	0 (0.0)	1 (4.0)	0 (0.0)	0 (0.0)	0 (0.0)	5 (1.1)
Repeats question/explanation ^a	4 (5.4)	0 (0.0)	0 (0.0)	0 (0.0)	2 (3.5)	2 (8.0)	1 (1.6)	0 (0.0)	0 (0.0)	9 (1.9)
Emphasizes important point ^a	4 (5.4)	0 (0.0)	0 (0.0)	0 (0.0)	2 (3.5)	0 (0.0)	0 (0.0)	1 (1.9)	0 (0.0)	7 (1.5)
Other ^a	33 (74.3)	34 (97.1)	44 (88.0)	47 (75.8)	52 (91.2)	21 (84.0)	62 (98.4)	47 (87.0)	39 (92.9)	401 (86.8)
Engaged ^b	79 (98.8)	42 (66.7)	62 (86.1)	76 (95.0)	63 (78.8)	40 (71.4)	53 (66.3)	73 (91.3)	39 (73.8)	347 (81.5)
Off-task ^b	1 (1.3)	21 (33.3)	10 (13.9)	4 (5.0)	17 (21.3)	16 (28.6)	27 (33.8)	7 (8.8)	21 (26.3)	124 (18.5)
Listening ^a	47 (63.3)	25 (71.4)	20 (40.0)	47 (75.8)	43 (78.9)	24 (96.0)	26 (41.3)	46 (85.2)	28 (66.7)	308 (66.7)
Individual ^b	24 (30.0)	30 (47.6)	53 (73.6)	0 (0.0)	28 (35.0)	13 (23.2)	0 (0.0)	0 (0.0)	13 (16.3)	161 (24.0)
Small ^b	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	44 (55.0)	0 (0.0)	0 (0.0)	44 (6.6)
Large ^b	56 (70.0)	33 (52.4)	19 (26.4)	80 (100)	52 (65.0)	43 (76.8)	36 (45.0)	80 (100)	67 (83.8)	466 (59.4)
Games/puzzles ^b	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Competition ^b	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Total	281 (13.3)	186 (8.8)	214 (10.1)	269 (12.7)	252 (12.4)	161 (7.6)	249 (11.8)	260 (12.3)	230 (10.9)	

^aPercentages (in parentheses) based on total observed frequency of teacher behavior.

^bPercentages (in parentheses) based on total number of observed moments.

Table U
Frequencies of Observed Teacher/Pupil Behaviors and
Organizational Activities by Class for Day 3

Behavior	Class									Total
	1	2	3	4	5	6	7	8	9	
Outlines objectives ^a	2 (2.8)	1 (2.6)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	3 (0.8)
Explains what to do next ^a	6 (8.3)	4 (10.3)	2 (4.9)	4 (7.3)	4 (6.7)	0 (0.0)	1 (2.3)	4 (8.9)	2 (8.0)	27 (6.4)
Reviews/summarizes ^a	3 (4.2)	0 (0.0)	2 (4.9)	24 (45.3)	0 (0.0)	0 (0.0)	0 (0.0)	1 (2.2)	0 (0.0)	30 (7.5)
Relates content ^a	1 (1.4)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (4.0)	2 (0.5)
Repeats question/explanation ^a	24 (33.3)	2 (5.1)	1 (2.4)	0 (0.0)	2 (3.3)	0 (0.0)	1 (2.3)	2 (4.4)	0 (0.0)	32 (8.0)
Emphasizes important point ^a	4 (5.6)	3 (7.7)	1 (2.4)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	2 (4.4)	0 (0.0)	10 (2.5)
Other ^a	32 (44.4)	39 (74.4)	33 (85.4)	23 (47.2)	34 (90.0)	20 (100)	42 (95.3)	36 (80.0)	22 (88.0)	295 (73.9)
Engaged ^b	73 (91.3)	61 (76.3)	66 (91.7)	60 (81.1)	70 (87.5)	48 (73.0)	65 (81.3)	61 (76.3)	30 (71.4)	536 (81.9)
Off-task ^b	7 (8.8)	19 (23.8)	6 (8.3)	14 (18.9)	10 (12.5)	16 (25.0)	13 (18.8)	19 (23.8)	12 (29.6)	118 (18.1)
Listening ^a	32 (72.2)	27 (69.2)	35 (85.4)	44 (83.0)	36 (60.0)	16 (80.0)	27 (61.4)	22 (48.9)	16 (64.0)	275 (68.9)
Individual ^b	21 (26.3)	47 (58.8)	0 (0.0)	0 (0.0)	39 (48.8)	29 (45.3)	51 (63.8)	46 (57.3)	11 (26.2)	244 (37.4)
Small ^b	0 (0.0)	0 (0.0)	29 (40.3)	15 (20.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	44 (6.7)
Large ^b	59 (73.8)	33 (41.3)	43 (59.7)	59 (79.7)	41 (51.3)	35 (54.7)	29 (36.3)	34 (42.3)	31 (73.3)	366 (53.3)
Games/puzzles ^b	0 (0.0)	0 (0.0)	0 (0.0)	6 (8.1)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	6 (0.9)
Competition ^b	0 (0.0)	0 (0.0)	0 (0.0)	6 (8.1)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	6 (0.9)
Total	284 (14.3)	226 (11.4)	220 (11.1)	237 (12.9)	256 (12.9)	164 (8.2)	231 (11.6)	227 (11.4)	125 (6.3)	

^aPercentages (in parentheses) based on total observed frequency of teacher behavior.

^bPercentages (in parentheses) based on total number of observed moments.

Table V
Frequencies of Observed Teacher/Pupil Behaviors and
Organizational Activities by Class for Day 4

Behavior	Class									Total
	1	2	3	4	5	6	7	8	9	
Outlines objectives ^a	0 (0.0)	1 (1.9)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.2)
Explains what to do next ^a	6 (8.0)	2 (3.8)	2 (5.3)	3 (10.7)	3 (4.8)	1 (3.4)	1 (1.3)	1 (2.1)	0 (0.0)	19 (4.3)
Reviews/summarizes ^a	1 (1.3)	1 (1.9)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	2 (0.5)
Relates content ^a	1 (1.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (3.4)	0 (0.0)	1 (2.1)	0 (0.0)	3 (0.7)
Repeats question/explanation ^a	8 (10.7)	2 (3.8)	0 (0.0)	0 (0.0)	2 (3.2)	1 (3.4)	0 (0.0)	2 (4.3)	0 (0.0)	15 (3.6)
Emphasizes important point ^a	1 (1.3)	1 (1.9)	1 (2.6)	0 (0.0)	1 (1.6)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	4 (0.9)
Other ^a	58 (77.3)	45 (86.5)	33 (92.1)	25 (89.3)	56 (90.3)	26 (89.7)	54 (98.2)	43 (91.5)	36 (100)	378 (89.6)
Engaged ^b	63 (78.8)	56 (70.0)	56 (77.8)	57 (79.2)	69 (86.3)	50 (89.3)	67 (83.8)	85 (96.6)	30 (71.4)	533 (82.0)
Off-task ^b	17 (21.3)	24 (30.0)	16 (22.2)	15 (20.8)	11 (13.8)	6 (10.7)	13 (16.3)	3 (3.4)	12 (28.6)	117 (18.0)
Listening ^a	37 (49.3)	38 (73.1)	9 (23.7)	23 (82.1)	38 (61.3)	21 (72.4)	31 (56.4)	36 (76.6)	22 (61.1)	255 (60.4)
Individual ^b	22 (27.5)	15 (18.8)	49 (68.1)	0 (0.0)	15 (18.8)	18 (32.1)	43 (53.8)	18 (20.5)	7 (16.7)	197 (29.8)
Small ^b	0 (0.0)	0 (0.0)	0 (0.0)	43 (59.7)	15 (18.8)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	58 (8.9)
Large ^b	58 (72.5)	65 (81.3)	23 (31.9)	29 (40.3)	50 (62.5)	38 (67.9)	37 (46.3)	70 (79.3)	35 (83.3)	405 (62.3)
Games/puzzles ^b	0 (0.0)	0 (0.0)	16 (22.2)	31 (43.1)	0 (0.0)	0 (0.0)	4 (5.0)	0 (0.0)	0 (0.0)	51 (7.8)
Competition ^b	0 (0.0)	0 (0.0)	12 (16.7)	31 (43.1)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	43 (6.6)
Total	272 (13.1)	250 (12.1)	219 (10.6)	257 (12.4)	260 (12.6)	162 (7.8)	250 (12.1)	259 (12.5)	142 (6.9)	

^aPercentages (in parentheses) based on total observed frequency of teacher behavior.

^bPercentages (in parentheses) based on total number of observed moments.

Table W
Frequencies of Observed Teacher/Pupil Behaviors and
Organizational Activities by Class for Day 5

Behavior	Class									Total
	1	2	3	4	5	6	7	8	9	
Outlines objectives ^a	0 (0.0)	1 (3.7)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.3)
Explains what to do next ^a	7 (9.5)	3 (11.1)	2 (4.3)	6 (12.2)	2 (4.5)	0 (0.0)	1 (1.7)	1 (2.0)	1 (3.9)	23 (5.9)
Reviews/summarizes ^a	3 (4.1)	0 (0.0)	1 (2.1)	24 (49.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	28 (7.1)
Relates content ^a	0 (0.0)	0 (0.0)	0 (0.0)	1 (2.0)	0 (0.0)	0 (0.0)	1 (1.7)	1 (2.0)	0 (0.0)	3 (0.8)
Repeats question/explanation ^a	3 (4.1)	0 (0.0)	2 (4.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (2.0)	1 (3.9)	7 (1.8)
Emphasizes important point ^a	2 (2.7)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	2 (0.5)
Other ^a	39 (79.7)	23 (85.2)	42 (89.4)	18 (36.7)	42 (93.5)	24 (100)	38 (96.7)	48 (94.1)	15 (84.2)	329 (83.7)
Engaged ^b	68 (85.0)	38 (71.4)	55 (85.9)	60 (83.3)	68 (85.0)	48 (85.7)	73 (91.3)	70 (87.5)	55 (80.9)	547 (84.2)
Off-task ^b	12 (15.0)	20 (28.6)	9 (14.1)	12 (16.7)	12 (15.0)	8 (14.3)	7 (8.9)	10 (12.5)	13 (19.1)	103 (15.8)
Listening ^a	33 (47.3)	23 (85.2)	3 (6.4)	45 (91.8)	2 (4.5)	16 (66.7)	24 (40.0)	29 (56.9)	6 (33.3)	183 (46.6)
Individual ^b	40 (50.0)	0 (0.0)	24 (37.3)	5 (6.9)	23 (28.3)	32 (57.1)	27 (33.8)	34 (42.3)	0 (0.0)	183 (28.5)
Small ^b	0 (0.0)	9 (12.9)	0 (0.0)	4 (5.6)	7 (8.8)	0 (0.0)	24 (30.0)	0 (0.0)	0 (0.0)	44 (6.3)
Large ^b	40 (50.0)	61 (87.1)	40 (62.3)	63 (87.5)	30 (62.5)	24 (42.9)	29 (36.3)	46 (57.3)	68 (100)	401 (64.8)
Games/puzzles ^b	8 (10.0)	63 (90.0)	35 (54.7)	8 (11.1)	47 (58.8)	0 (0.0)	24 (30.0)	0 (0.0)	62 (91.2)	247 (38.0)
Competition ^b	8 (10.0)	46 (65.7)	35 (54.7)	1 (1.4)	47 (58.8)	0 (0.0)	24 (30.0)	0 (0.0)	62 (91.2)	223 (34.3)
Total	285 (12.1)	299 (12.7)	248 (10.6)	247 (10.5)	300 (12.8)	132 (6.5)	292 (12.4)	240 (10.2)	283 (12.1)	

^aPercentages (in parentheses) based on total observed frequency of teacher behavior.

^bPercentages (in parentheses) based on total number of observed moments.

Table X
Frequencies of Observed Teacher/Pupil Behaviors and
Organizational Activities by Class for Day 6

Behavior	Class									Total
	1	2	3	4	5	6	7	8	9	
Outline objectives ^a	3 (3.9)	0 (0.0)	1 (1.6)	1 (2.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	5 (1.1)
Explains what to do next ^a	7 (9.1)	6 (12.2)	1 (1.6)	9 (17.6)	2 (3.1)	1 (3.1)	2 (3.5)	2 (3.7)	1 (5.6)	31 (7.0)
Reviews/summarizes ^a	2 (2.6)	0 (0.0)	0 (0.0)	3 (5.9)	1 (1.5)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	6 (1.3)
Relates content ^a	2 (2.6)	0 (0.0)	0 (0.0)	0 (0.0)	1 (1.5)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	3 (0.7)
Repeats question/explanation ^a	3 (3.9)	1 (2.0)	3 (4.8)	0 (0.0)	1 (1.5)	1 (3.1)	1 (1.8)	3 (8.6)	1 (5.6)	14 (3.1)
Emphasizes important point ^a	0 (0.0)	3 (6.1)	1 (1.6)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	4 (0.9)
Other ^a	60 (77.9)	39 (79.4)	56 (80.3)	38 (74.3)	60 (92.3)	30 (93.8)	54 (94.7)	30 (85.7)	16 (88.9)	385 (85.9)
Engaged ^b	71 (88.8)	61 (76.3)	73 (91.3)	64 (88.9)	72 (90.0)	56 (93.3)	69 (86.3)	72 (90.0)	57 (81.4)	595 (87.2)
Off-task ^b	9 (11.3)	19 (23.8)	7 (8.8)	8 (11.1)	8 (10.0)	4 (6.7)	11 (13.8)	8 (10.0)	13 (18.6)	87 (12.8)
Listening ^a	45 (58.4)	25 (51.0)	43 (69.4)	31 (60.8)	36 (53.4)	16 (50.0)	29 (50.9)	16 (45.7)	9 (30.0)	250 (56.1)
Individual ^b	18 (22.5)	38 (47.5)	28 (35.0)	0 (0.0)	34 (42.5)	23 (38.3)	44 (55.0)	53 (66.3)	55 (78.6)	293 (43.0)
Small ^b	0 (0.0)	7 (8.8)	0 (0.0)	46 (83.9)	8 (10.0)	0 (0.0)	0 (0.0)	1 (1.3)	0 (0.0)	62 (9.1)
Large ^b	62 (77.5)	35 (43.8)	52 (65.0)	26 (36.1)	38 (47.5)	37 (61.7)	36 (45.0)	26 (32.3)	15 (21.4)	327 (47.9)
Games/puzzles ^b	24 (30.0)	0 (0.0)	0 (0.0)	11 (15.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	35 (5.1)
Competition ^b	0 (0.0)	0 (0.0)	0 (0.0)	11 (15.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	11 (1.6)
Total	306 (14.5)	234 (11.1)	265 (12.6)	248 (11.8)	261 (12.4)	168 (8.0)	246 (11.7)	211 (10.0)	167 (7.9)	

^aPercentages (in parentheses) based on total observed frequency of teacher behavior.

^bPercentages (in parentheses) based on total number of observed moments.

Table Y
Frequencies of Observed Teacher/Pupil Behaviors and
Organizational Activities by Class for Day 7

Behavior	Class									Total
	1	2	3	4	5	6	7	8	9	
Outlines objectives ^a	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Explains what to do next ^a	4 (5.0)	8 (12.5)	2 (3.3)	2 (3.9)	1 (1.6)	0 (0.0)	2 (4.3)	1 (2.6)	2 (6.1)	22 (4.9)
Reviews/summarizes ^a	0 (0.0)	1 (1.6)	1 (1.7)	0 (0.0)	1 (1.6)	0 (0.0)	0 (0.0)	3 (7.9)	0 (0.0)	6 (1.3)
Relates content ^a	2 (2.5)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (2.6)	0 (0.0)	3 (0.7)
Repeats question/explanation ^a	2 (2.5)	0 (0.0)	1 (1.7)	0 (0.0)	1 (1.6)	0 (0.0)	2 (4.3)	1 (2.6)	1 (3.0)	8 (1.8)
Emphasizes important point ^a	1 (1.3)	3 (4.7)	0 (0.0)	0 (0.0)	0 (0.0)	1 (9.1)	0 (0.0)	0 (0.0)	0 (0.0)	5 (1.1)
Other ^a	71 (88.8)	52 (81.3)	56 (93.3)	49 (96.1)	60 (95.2)	10 (90.9)	42 (91.3)	32 (84.2)	30 (90.9)	402 (90.1)
Engaged ^b	53 (76.8)	61 (76.3)	63 (87.5)	68 (94.4)	58 (72.5)	47 (83.9)	51 (63.8)	63 (78.8)	31 (49.2)	495 (75.9)
Off-task ^b	16 (23.2)	19 (23.8)	9 (12.5)	4 (5.6)	22 (27.5)	9 (16.1)	29 (36.3)	17 (21.3)	32 (50.8)	157 (24.1)
Listening ^a	37 (46.3)	21 (32.9)	28 (46.7)	43 (88.2)	12 (19.0)	2 (18.2)	14 (30.4)	13 (34.2)	11 (33.3)	183 (41.0)
Individual ^b	6 (8.7)	46 (57.5)	42 (58.3)	0 (0.0)	61 (76.3)	28 (50.0)	54 (67.5)	67 (83.8)	38 (60.3)	342 (52.5)
Small ^b	0 (0.0)	16 (20.0)	0 (0.0)	9 (12.5)	10 (12.5)	0 (0.0)	0 (0.0)	0 (0.0)	25 (39.7)	60 (9.2)
Large ^b	63 (91.3)	18 (22.5)	30 (41.7)	63 (87.5)	9 (11.3)	28 (50.0)	26 (32.5)	13 (16.3)	0 (0.0)	250 (38.3)
Games/puzzles ^b	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Competition ^b	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Total	235 (13.2)	243 (12.7)	232 (12.0)	240 (12.4)	235 (12.2)	125 (6.5)	220 (11.4)	211 (10.9)	170 (8.3)	

^aPercentages (in parentheses) based on total observed frequency of teacher behavior.

^bPercentages (in parentheses) based on total number of observed moments.

Table Z
Frequencies of Observed Teacher/Pupil Behaviors and
Organizational Activities by Class for Day 8

Behavior	Class									Total
	1	2	3	4	5	6	7	8	9	
Outlines objectives ^a	0 (0.0)	1 (1.8)	2 (3.8)	2 (3.6)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	5 (1.2)
Explains what to do next ^a	3 (7.5)	2 (3.6)	1 (1.9)	3 (5.5)	2 (4.0)	2 (6.9)	4 (12.1)	2 (4.1)	1 (2.1)	20 (4.9)
Reviews/summarizes ^a	19 (47.5)	0 (0.0)	1 (1.9)	14 (25.5)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	34 (8.3)
Relates content ^a	1 (2.5)	0 (0.0)	1 (1.9)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	2 (0.5)
Repeats question/explanation ^a	0 (0.0)	0 (0.0)	3 (5.7)	0 (0.0)	1 (2.0)	0 (0.0)	0 (0.0)	1 (2.0)	1 (2.1)	6 (1.5)
Emphasizes important point ^a	0 (0.0)	2 (3.6)	1 (1.9)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	3 (0.7)
Other ^a	17 (42.3)	50 (90.9)	44 (83.0)	36 (65.5)	47 (94.0)	27 (93.1)	29 (87.9)	46 (93.9)	46 (95.8)	342 (83.0)
Engaged ^b	56 (100)	71 (80.7)	77 (96.3)	59 (81.9)	53 (66.3)	54 (85.7)	67 (83.8)	62 (77.5)	43 (83.3)	544 (83.3)
Off-task ^b	0 (0.0)	17 (19.3)	3 (3.8)	13 (18.1)	27 (33.8)	9 (14.3)	13 (16.3)	18 (22.5)	9 (16.7)	109 (16.7)
Listening ^a	39 (97.5)	26 (47.3)	29 (54.7)	42 (76.4)	12 (24.0)	7 (24.1)	14 (42.4)	20 (40.8)	20 (41.7)	209 (50.7)
Individual ^b	10 (17.9)	34 (38.6)	41 (51.3)	0 (0.0)	57 (71.3)	29 (46.0)	31 (38.8)	58 (72.5)	10 (18.5)	270 (41.3)
Small ^b	0 (0.0)	8 (9.1)	0 (0.0)	23 (31.9)	10 (12.5)	1 (1.6)	24 (30.0)	8 (10.0)	20 (37.0)	94 (14.4)
Large ^b	46 (82.1)	46 (52.3)	39 (48.8)	49 (68.1)	13 (16.3)	33 (52.4)	25 (31.3)	14 (17.5)	24 (44.4)	289 (44.3)
Games/puzzles ^b	0 (0.0)	0 (0.0)	0 (0.0)	12 (16.7)	0 (0.0)	0 (0.0)	20 (25.0)	0 (0.0)	0 (0.0)	32 (4.9)
Competition ^b	0 (0.0)	0 (0.0)	0 (0.0)	12 (16.7)	0 (0.0)	0 (0.0)	20 (25.0)	0 (0.0)	0 (0.0)	32 (4.9)
Total	191 (9.6)	257 (12.9)	242 (12.2)	265 (13.3)	222 (11.2)	162 (8.1)	247 (12.4)	229 (11.5)	176 (8.8)	

^aPercentages (in parentheses) based on total observed frequency of teacher behavior.

^bPercentages (in parentheses) based on total number of observed moments.

Table AA
Frequencies of Observed Teacher/Pupil Behaviors and
Organizational Activities by Class for Day 9

Behavior	Class									Total
	1	2	3	4	5	6	7	8	9	
Outlines objectives ^a	2 (3.5)	1 (1.3)	0 (0.0)	0 (0.0)	1 (2.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	4 (0.9)
Explains what to do next ^a	8 (14.0)	5 (6.5)	3 (7.5)	2 (4.7)	4 (7.8)	0 (0.0)	3 (4.8)	4 (8.9)	3 (7.3)	32 (7.2)
Reviews/summarizes ^a	5 (8.8)	0 (0.0)	0 (0.0)	1 (2.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	6 (1.3)
Relates content ^a	1 (1.8)	1 (1.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	2 (0.4)
Repeats question/explanation ^a	3 (5.3)	1 (1.3)	1 (2.3)	0 (0.0)	1 (2.0)	0 (0.0)	2 (3.2)	2 (4.4)	0 (0.0)	10 (2.2)
Emphasizes important point ^a	0 (0.0)	3 (3.9)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	3 (4.8)	0 (0.0)	0 (0.0)	6 (1.3)
Other ^a	38 (66.7)	66 (85.7)	36 (90.0)	40 (93.0)	45 (88.2)	29 (100)	54 (87.1)	39 (86.7)	38 (92.7)	385 (86.5)
Engaged ^b	65 (92.9)	87 (90.6)	70 (87.5)	57 (89.1)	62 (77.5)	53 (75.7)	58 (72.5)	74 (84.1)	55 (65.5)	581 (81.6)
Off-task ^b	5 (7.1)	9 (9.4)	10 (12.5)	7 (10.9)	18 (22.5)	17 (24.3)	22 (27.3)	14 (15.9)	29 (34.5)	131 (18.4)
Listening ^a	44 (77.2)	39 (50.6)	14 (35.0)	24 (55.8)	24 (47.1)	7 (24.1)	27 (43.3)	18 (40.0)	14 (34.1)	211 (47.4)
Individual ^b	6 (8.6)	45 (46.9)	45 (56.3)	9 (14.1)	39 (48.8)	38 (54.3)	43 (53.8)	29 (33.0)	36 (42.9)	290 (40.7)
Small ^b	0 (0.0)	21 (21.9)	0 (0.0)	27 (42.2)	12 (15.0)	1 (1.4)	6 (7.5)	20 (22.7)	27 (32.1)	114 (16.0)
Large ^b	64 (91.4)	30 (31.3)	35 (43.8)	28 (43.8)	29 (36.3)	31 (44.3)	31 (38.8)	39 (44.3)	21 (25.0)	308 (43.3)
Games/puzzles ^b	0 (0.0)	0 (0.0)	0 (0.0)	26 (40.6)	0 (0.0)	0 (0.0)	6 (7.5)	37 (42.0)	17 (20.2)	36 (12.1)
Competition ^b	0 (0.0)	0 (0.0)	0 (0.0)	26 (40.6)	0 (0.0)	0 (0.0)	6 (7.5)	37 (42.0)	17 (20.2)	36 (12.1)
Total	241 (10.7)	308 (13.7)	214 (9.3)	247 (11.0)	235 (10.4)	176 (7.8)	261 (11.6)	313 (13.9)	257 (11.4)	

^aPercentages (in parentheses) based on total observed frequency of teacher behavior.

^bPercentages (in parentheses) based on total number of observed moments.

Table BB
Frequencies of Observed Teacher/Pupil Behaviors and
Organizational Activities by Class for Day 10

Behavior	Class									Total
	1	2	3	4	5	6	7	8	9	
Outlines objectives ^a	0 (0.0)	1 (2.0)	0 (0.0)	1 (2.6)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (3.7)	3 (0.7)
Explains what to do next ^a	8 (14.3)	2 (4.0)	2 (3.2)	5 (12.8)	2 (3.5)	1 (2.4)	3 (9.1)	6 (10.2)	5 (18.3)	36 (8.1)
Reviews/summarizes ^a	2 (3.6)	0 (0.0)	1 (1.6)	9 (23.1)	0 (0.0)	0 (0.0)	1 (1.8)	0 (0.0)	2 (7.4)	15 (3.4)
Relaxes content ^a	1 (1.8)	0 (0.0)	0 (0.0)	1 (2.6)	1 (1.8)	0 (0.0)	1 (1.8)	0 (0.0)	0 (0.0)	4 (0.9)
Repeats question/explanation ^a	2 (3.6)	1 (2.0)	4 (6.3)	0 (0.0)	1 (1.8)	1 (2.4)	3 (5.5)	5 (8.5)	0 (0.0)	17 (3.8)
Emphasizes important point ^a	1 (1.8)	1 (2.0)	0 (0.0)	1 (2.6)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	3 (0.7)
Other ^a	42 (75.0)	45 (90.0)	55 (88.7)	22 (56.4)	53 (93.0)	39 (93.1)	45 (81.8)	48 (81.4)	19 (70.4)	368 (82.5)
Engaged ^b	76 (95.0)	76 (79.2)	62 (77.5)	65 (90.3)	55 (91.7)	53 (88.3)	57 (81.4)	72 (90.0)	36 (64.3)	552 (84.4)
Off-task ^b	4 (5.0)	20 (20.8)	18 (22.5)	7 (9.7)	5 (8.3)	7 (11.7)	13 (18.6)	8 (10.0)	20 (35.7)	102 (15.6)
Listening ^a	53 (94.6)	19 (38.0)	23 (40.3)	36 (92.3)	26 (45.6)	22 (53.7)	24 (63.6)	38 (64.4)	16 (59.3)	259 (58.1)
Individual ^b	6 (7.5)	54 (56.3)	57 (71.3)	0 (0.0)	26 (43.3)	15 (25.0)	14 (20.0)	3 (3.8)	3 (5.4)	178 (27.2)
Small ^b	0 (0.0)	18 (18.3)	0 (0.0)	46 (63.9)	5 (8.3)	0 (0.0)	33 (47.1)	20 (25.0)	11 (19.6)	133 (20.3)
Large ^b	74 (92.5)	24 (25.0)	23 (28.8)	26 (36.1)	29 (48.3)	45 (75.0)	23 (32.9)	57 (71.3)	42 (75.0)	343 (52.4)
Games/puzzles ^b	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	18 (22.5)	16 (28.6)	34 (5.2)
Competition ^b	0 (0.0)	0 (0.0)	0 (0.0)	42 (58.3)	0 (0.0)	0 (0.0)	0 (0.0)	18 (22.5)	16 (28.6)	76 (11.6)
Total	269 (12.7)	261 (12.3)	247 (11.6)	261 (12.3)	203 (9.6)	183 (8.6)	219 (10.3)	293 (13.3)	187 (8.8)	

^aPercentages (in parentheses) based on total observed frequency of teacher behavior.

^bPercentages (in parentheses) based on total number of observed moments.

Table CC

Total Frequencies of Observed Teacher/Pupil Behaviors
and Organizational Activities by Class

Behavior	Class									Total
	1	2	3	4	5	6	7	8	9	
Outlines objectives ^a	10 (1.5)	7 (1.4)	3 (0.6)	10 (2.0)	4 (0.7)	0 (0.0)	0 (0.0)	1 (0.2)	1 (0.3)	36 (0.8)
Explains what to do next ^a	62 (9.1)	33 (6.4)	23 (4.7)	63 (12.5)	25 (4.6)	8 (2.3)	24 (4.3)	30 (5.8)	20 (3.6)	286 (6.5)
Reviews/summarizes ^a	41 (6.0)	3 (0.6)	6 (1.2)	85 (16.9)	2 (0.4)	0 (0.0)	8 (1.4)	10 (1.9)	4 (1.1)	159 (3.6)
Relates content ^a	15 (2.2)	1 (0.2)	1 (0.2)	7 (1.4)	2 (0.4)	2 (0.8)	2 (0.4)	5 (1.0)	1 (0.3)	36 (0.8)
Repeats question/explanation ^a	52 (7.6)	7 (1.4)	15 (3.1)	0 (0.0)	12 (2.2)	5 (1.9)	19 (3.4)	30 (5.8)	10 (2.8)	150 (3.4)
Emphasizes important point ^a	14 (2.1)	18 (3.5)	4 (0.8)	1 (0.2)	3 (0.6)	1 (0.4)	5 (0.9)	6 (1.2)	2 (0.6)	54 (1.2)
Other ^a	488 (71.6)	444 (86.5)	433 (89.3)	337 (67.0)	492 (91.1)	248 (94.7)	495 (89.5)	436 (84.2)	319 (89.4)	3692 (83.7)
Engaged ^b	681 (90.2)	619 (77.1)	633 (87.0)	637 (88.2)	605 (81.8)	478 (82.3)	622 (78.7)	717 (86.2)	454 (71.9)	5446 (82.7)
Off-task ^b	74 (9.8)	184 (22.9)	95 (13.0)	85 (11.8)	135 (18.2)	103 (17.7)	168 (21.3)	115 (13.8)	177 (28.1)	1136 (17.3)
Listening ^a	435 (64.0)	257 (50.1)	223 (45.8)	377 (75.0)	251 (46.5)	136 (51.9)	234 (42.3)	303 (58.5)	166 (46.5)	2382 (54.0)
Individual ^b	161 (21.3)	363 (45.2)	375 (51.5)	14 (1.9)	322 (43.5)	249 (42.9)	307 (38.9)	308 (37.0)	187 (29.6)	2286 (34.7)
Small ^b	0 (0.0)	79 (9.8)	29 (4.0)	232 (32.1)	67 (9.1)	2 (0.3)	172 (21.8)	49 (5.9)	83 (13.2)	713 (10.8)
Large ^b	594 (78.7)	361 (45.0)	324 (44.5)	476 (65.9)	351 (47.4)	330 (56.8)	311 (39.4)	475 (57.1)	361 (57.2)	3583 (54.4)
Games/puzzles ^b	32 (4.2)	63 (7.8)	51 (7.0)	94 (13.0)	47 (6.4)	0 (0.0)	54 (6.8)	55 (6.6)	95 (15.1)	491 (7.5)
Competition ^b	8 (1.1)	46 (5.7)	47 (6.3)	129 (17.3)	47 (6.4)	0 (0.0)	50 (6.3)	55 (6.6)	95 (15.1)	477 (7.2)
Total	2667 (12.7)	2485 (11.9)	2262 (10.8)	2547 (12.1)	2365 (11.3)	1560 (7.5)	2471 (11.3)	2595 (12.4)	1975 (9.4)	

^aPercentages (in parentheses) based on total observed frequency of teacher behavior.

^bPercentages (in parentheses) based on total number of observed moments.

Table DD
Mean Percentages of Classroom Behavior
Occurrence by Teacher^a

Behavior	Teacher								
	1	2	3	4	5	6	7	8	9
Outlines objectives	1.4	1.5	0.5	1.7	1.2	0.0	0.0	0.1	0.4
Explains what to do next	9.3	6.7	5.0	11.7	5.1	2.0	4.6	5.9	6.4
Reviews/summarizes	8.0	0.5	1.2	16.6	0.3	0.0	1.1	1.6	1.0
Relates content	2.2	0.1	0.2	1.2	0.3	0.7	0.4	0.9	0.4
Repeats question/explanation	7.3	1.4	2.8	0.0	2.2	1.7	3.0	5.1	2.6
Emphasizes important point	1.9	3.3	0.9	0.3	0.5	1.0	0.7	1.0	0.3
Other	69.9	86.5	89.4	68.6	90.4	94.7	90.2	85.5	89.1
Engaged	90.4	76.5	86.9	88.2	82.3	82.1	78.8	86.1	71.9

^a Means calculated across days of instruction.

Table DD (continued)^a

Behavior	Teacher								
	1	2	3	4	5	6	7	8	9
Off-task	9.7	23.6	13.1	11.8	17.7	17.9	21.3	14.0	30.5
Listening	66.6	54.0	45.5	76.2	46.0	50.8	43.3	56.1	48.0
Individual	20.9	44.9	51.6	2.1	41.4	43.1	38.7	38.0	28.4
Small	0.0	9.2	4.0	32.6	8.6	0.3	22.1	5.9	12.8
Large	79.1	46.0	44.4	65.3	50.1	56.6	39.3	56.1	58.7
Games/puzzles	4.0	9.0	7.7	13.5	5.9	0.0	6.8	6.5	14.0
Competition	1.0	6.6	7.1	18.4	5.9	0.0	6.3	6.5	14.0

^aMeans calculated across days of instruction.

APPENDIX D

1. Training of Lesson Plan Raters
2. Generalizability of Raters
3. Sample Planning Statements
4. Rater Agreement Tables
5. Planning Category Frequency Tables
6. Mean Percentages of Planning Categories
(Across Days)
7. Written Lesson Plans

RATER TRAINING

Training for lesson plan raters took place over a 2-day period. On the first day planning statement categories were described and numerous examples of written statements which might be included in each category were discussed. The second day raters actually coded several sample lesson plan statements believed representative of those to be found in actual teacher plans. Coding and subsequent discussion continued until both raters felt comfortable with categories as well as coding procedures. With regard to actual coding procedure, categories of planning are marked whenever the teacher mentions a new category. For example, the teacher planning statement ". . . at the beginning of the class, Jim and Sarah will play the DMP game . . ." would be coded in two categories, Activities (Individual or Small Group) and Materials (Individual or Small Group). Final category statement frequencies for each teacher were determined by taking an average category frequency for the two raters.

The remainder of this appendix includes (a) a description of the procedure used to assess rater generalizability as well as generalizability coefficients obtained for each category,

(b) planning statement examples used in rater training,
 (b) actual category frequencies for each teacher for each day
 as coded by each rater, and (d) average category frequencies
 for each teacher for each day, and for each teacher over the
 entire topic.

RATER GENERALIZABILITY

The procedure used in this study for estimating rater generalizability is identical to that described in chapter 3 for observer generalizability. Each rater coded independently each teacher's lesson plans for the entire instructional period. The statistical methodology used is that described by Cronbach, Gleser, Nanda, and Rajaratnam (1972). Generalizability coefficients (ρ) obtained for each planning category are: Objectives (Large Group), $\rho = .91$; Objectives (Individual/Small), $\rho = .95$; Content (Large Group), $\rho = .43$; Content (Individual/Small), $\rho = .66$; Activities (Large Group), $\rho = .68$; Activities (Individual/Small), $\rho = .92$; Instruction (Large Group), $\rho = .78$; Instruction (Individual/Small), $\rho = .81$; Organization, $\rho = .58$; Materials (Large Group), $\rho = .82$; Materials (Individual/Small), $\rho = .91$; Diagnosis (Large Group), $\rho = .27^*$; Diagnosis (Individual/Small), $\rho = .10^*$; Evaluation (Large Group), $\rho = .88$;

Evaluation (Individual/Small), $\rho = .84$; Alternative Procedures (Large Group), $\rho = \text{low}^*$; Alternative Procedures (Individual/Small), $\rho = \text{low}^*$.

Coefficients labeled with asterisks are thought to be artificially low or high due to the statistical procedure used to calculate ρ . As indicated in chapter 3, when only few instances of a particular category are observed, a few disagreements generate an artificially low ρ value. As coded by each rater, actual category frequencies for each teacher for each day are shown in Tables A-J.

LESSON PLAN STATEMENTS--EXAMPLES

1. Make numbers using colored paper.
2. Pages 9-10 (Jim & Martha are having a hard time understanding).
3. Work at board for 30 minutes. Then individual work.
4. Introduce Geometry; use Moser's 1st chapter.
5. Introduce parallel lines.
6. Have whole group do pp. 10-12 in book.
7. Let those who have completed their work play the games which are available.
8. Prepare an overhead transparency and have kids work by themselves.
9. Assign the next 3 pages for reading.

10. Review the concept of separation of church and state.
11. The way the kids are grouped is not working.
12. Lead to the concept of quadrilateral.
13. Draw a picture of a triangle. Bisect the largest angle and then draw a perpendicular from vertex A to opposite side. Show that perpendicular does not necessarily lie in the interior of the triangle.
14. Relate today's lesson to yesterday's.
15. Allow time to complete the next 5 problems in small groups.
16. Discuss the function of bark on a tree.
17. Check the problems the kids did yesterday.
18. Distribute the sheets on special triangles.
19. Correct the last page and talk about any errors.

20. Introduce the concept of 'plane'. Use the materials provided.
21. Group kids as follows: (names)
22. Begin class by assigning pp. 3-6.
23. Define the concept of 'right angle'.
24. Assign next two problems. Walk around the room helping individuals. Allow students to help each other. When students finish, give out activity cards until end of period.
25. Students will be using protractor, ruler & compass.
26. Using the large slide rule, we will discuss how to use the C & D scales in order to multiply and divide.
27. (names several students) - These students are doing well and can work independently or in small groups.
28. Correct papers - kids form small groups.
29. Children should solve problems using only their blocks.

30. Do pp. 6-8 of textbook using answer key to check.

31. After working alone, students will move to their small groups and prepare for their next assignment.

Table A
 Rater Frequencies for Lesson Plan Categories
 by Teacher for Day 1

Category/rater	Teacher								
	1	2	3	4	5	6	7	8	9
Objectives (large)									
Rater 1	1	0	1	0	2	0	0	0	0
Rater 2	1	0	1	0	2	2	0	0	0
Objectives (individual/small)									
Rater 1	0	0	0	0	0	0	0	0	0
Rater 2	0	0	0	0	0	0	0	0	0
Content (large)									
Rater 1	0	0	0	0	1	0	1	0	0
Rater 2	0	0	1	0	1	0	1	0	1
Content (individual/small)									
Rater 1	0	0	0	0	0	0	0	0	0
Rater 2	0	0	0	0	0	0	0	0	0
Activities (large)									
Rater 1	0	3	3	0	3	1	0	0	0
Rater 2	0	1	2	0	2	1	1	0	0
Activities (individual/small)									
Rater 1	0	0	0	0	1	0	1	0	0
Rater 2	0	0	0	0	2	0	0	0	0

Table A (continued)

Category/rater	Teacher								
	1	2	3	4	5	6	7	8	9
Instruction (large)									
Rater 1	2	0	3	3	1	1	1	0	2
Rater 2	2	0	3	2	0	1	2	0	0
Instruction (individual/small)									
Rater 1	0	0	0	0	0	0	0	0	0
Rater 2	0	0	0	0	0	0	0	0	0
Organization									
Rater 1	0	2	1	1	1	0	1	0	0
Rater 2	0	1	1	0	2	0	1	0	0
Materials (large)									
Rater 1	2	3	4	2	3	2	1	0	2
Rater 2	2	2	4	3	2	1	0	0	2
Materials (individual/small)									
Rater 1	0	0	0	0	1	0	1	0	0
Rater 2	0	0	0	0	1	0	0	0	0
Diagnosis (large)									
Rater 1	0	0	0	0	0	0	0	0	0
Rater 2	0	0	0	0	0	0	0	0	0
Diagnosis (individual/small)									
Rater 1	0	0	1	0	1	0	0	0	0
Rater 2	0	0	0	0	0	0	0	0	0

Table A (continued)

Category/rater	Teacher								
	1	2	3	4	5	6	7	8	9
Evaluation (large)									
Rater 1	0	1	1	0	0	0	1	0	0
Rater 2	0	1	1	0	0	0	1	0	0
Evaluation (individual/small)									
Rater 1	0	0	0	0	0	0	0	0	0
Rater 2	0	0	0	0	0	0	0	0	0
Alternative procedures (large)									
Rater 1	0	0	0	0	0	0	0	0	0
Rater 2	0	0	0	0	0	0	0	0	0
Alternative procedures (individual/small)									
Rater 1	0	0	0	0	0	0	0	0	0
Rater 2	0	0	0	0	0	0	0	0	0

Table B
 Rater Frequencies for Lesson Plan Categories
 by Teacher for Day 2

Category/rater	Teacher								
	1	2	3	4	5	6	7	8	9
Objectives (large)									
Rater 1	1	0	1	0	1	0	0	0	0
Rater 2	1	0	1	0	1	0	0	0	0
Objectives (individual/small)									
Rater 1	0	0	0	0	0	0	0	0	0
Rater 2	0	0	0	0	0	0	0	0	0
Content (large)									
Rater 1	0	0	1	0	0	0	1	1	0
Rater 2	0	0	1	1	0	0	1	1	0
Content (individual/small)									
Rater 1	0	0	0	0	0	0	0	0	0
Rater 2	0	0	0	0	0	0	0	0	0
Activities (large)									
Rater 1	0	1	0	3	2	1	0	0	1
Rater 2	0	1	2	3	2	1	2	0	1
Activities (individual/small)									
Rater 1	0	0	3	0	0	0	3	0	0
Rater 2	0	0	0	0	1	0	0	0	0

Table B (continued)

Category/rater	Teacher								
	1	2	3	4	5	6	7	8	9
Instruction (large)									
Rater 1	2	3	1	2	4	2	1	1	1
Rater 2	1	2	1	0	2	2	1	0	0
Instruction (individual/small)									
Rater 1	0	0	2	0	0	0	0	0	0
Rater 2	0	0	0	0	0	0	0	0	0
Organization									
Rater 1	0	0	1	1	0	0	2	0	0
Rater 2	0	0	1	0	1	0	1	0	0
Materials (large)									
Rater 1	1	2	1	4	4	2	0	3	2
Rater 2	2	2	2	3	4	0	0	1	2
Materials (individual/small)									
Rater 1	0	0	3	0	0	0	2	0	0
Rater 2	0	0	0	0	0	0	1	0	0
Diagnosis (large)									
Rater 1	0	0	0	0	0	0	1	0	0
Rater 2	0	0	0	0	0	0	1	0	0
Diagnosis (individual/small)									
Rater 1	0	0	2	0	0	0	0	0	0
Rater 2	0	0	0	0	0	0	0	0	0

Table B (continued)

Category/rater	Teacher								
	1	2	3	4	5	6	7	8	9
Evaluation (large)									
Rater 1	0	1	1	0	0	0	0	0	0
Rater 2	0	1	1	0	0	0	1	0	0
Evaluation (individual/small)									
Rater 1	0	0	0	0	0	0	1	0	0
Rater 2	0	0	0	0	0	0	0	0	0
Alternative procedures (large)									
Rater 1	0	0	0	0	0	0	0	0	0
Rater 2	0	0	0	0	0	0	0	0	0
Alternative procedures (individual/small)									
Rater 1	0	0	0	0	0	0	0	0	0
Rater 2	0	0	0	0	0	0	0	0	0

Table C
 Rater Frequencies for Lesson Plan Categories
 by Teacher for Day 3

Category/rater	Teacher								
	1	2	3	4	5	6	7	8	9
Objectives (large)									
Rater 1	1	0	1	0	2	0	0	0	0
Rater 2	1	0	1	0	2	0	0	0	0
Objectives (individual/small)									
Rater 1	0	0	0	0	0	0	0	0	0
Rater 2	0	0	0	0	0	0	0	0	0
Content (large)									
Rater 1	0	0	1	0	0	1	1	1	0
Rater 2	0	0	1	0	0	0	1	1	0
Content (individual/small)									
Rater 1	0	0	0	0	0	0	0	0	0
Rater 2	0	0	0	0	0	0	0	0	0
Activities (large)									
Rater 1	0	3	1	0	2	1	3	1	1
Rater 2	0	0	1	3	2	1	2	1	1
Activities (individual/small)									
Rater 1	0	0	0	1	1	0	0	0	0
Rater 2	0	0	0	0	0	0	0	0	0

Table C (continued)

Category/rater	Teacher								
	1	2	3	4	5	6	7	8	9
Instruction (large)									
Rater 1	2	2	2	2	4	1	0	0	0
Rater 2	2	2	1	0	3	1	1	0	0
Instruction (individual/small)									
Rater 1	0	0	0	0	0	0	1	0	0
Rater 2	0	0	0	0	0	0	0	0	0
Organization									
Rater 1	0	0	1	0	1	0	2	0	0
Rater 2	0	0	1	1	1	0	1	0	0
Materials (large)									
Rater 1	2	3	2	4	2	1	2	2	1
Rater 2	2	3	2	4	2	0	1	2	1
Materials (individual/small)									
Rater 1	0	0	0	1	1	0	0	0	0
Rater 2	0	0	0	0	1	0	0	0	0
Diagnosis (large)									
Rater 1	0	0	1	0	0	0	1	0	0
Rater 2	0	0	0	0	0	0	0	0	0
Daignosis (individual/small)									
Rater 1	0	0	1	0	1	0	1	0	0
Rater 2	0	0	0	0	0	0	0	0	0

Table C (continued)

Category/rater	Teacher								
	1	2	3	4	5	6	7	8	9
Evaluation (large)									
Rater 1	0	1	0	0	0	0	0	0	0
Rater 2	0	1	0	0	0	0	0	0	0
Evaluation (individual/small)									
Rater 1	0	0	0	0	0	0	0	0	0
Rater 2	0	0	0	0	0	0	0	0	0
Alternative procedures (large)									
Rater 1	0	0	0	0	0	0	0	0	0
Rater 2	0	0	0	0	0	0	0	0	0
Alternative procedures (individual/small)									
Rater 1	0	0	0	0	0	0	0	0	0
Rater 2	0	0	0	0	0	0	0	0	0

Table D
 Rater Frequencies for Lesson Plan Categories
 by Teacher for Day 4

Category/rater	Teacher								
	1	2	3	4	5	6	7	8	9
Objectives (large)									
Rater 1	1	0	1	0	0	0	0	0	0
Rater 2	1	0	1	0	0	0	0	0	0
Objectives (individual/small)									
Rater 1	0	0	0	0	2	0	0	0	0
Rater 2	0	0	0	0	2	0	0	0	0
Content (large)									
Rater 1	0	0	0	0	0	2	0	0	0
Rater 2	0	0	0	0	0	0	0	0	0
Content (individual/small)									
Rater 1	0	0	0	0	0	0	0	0	0
Rater 2	0	0	0	0	2	0	0	0	0
Activities (large)									
Rater 1	1	1	0	1	0	0	0	1	1
Rater 2	1	2	0	4	0	0	0	1	1
Activities (individual/small)									
Rater 1	0	1	3	1	5	0	1	0	0
Rater 2	0	0	3	0	4	0	2	0	0

Table D (continued)

Category/rater	Teacher								
	1	2	3	4	5	6	7	8	9
Instruction (large)									
Rater 1	2	3	0	1	0	1	0	0	0
Rater 2	1	3	0	0	0	1	1	0	0
Instruction (individual/small)									
Rater 1	0	0	2	1	2	0	1	0	0
Rater 2	0	0	1	0	1	0	0	0	0
Organization									
Rater 1	0	0	1	2	1	0	1	1	0
Rater 2	0	0	1	1	1	0	1	1	0
Materials (large)									
Rater 1	1	3	0	2	0	0	0	1	1
Rater 2	0	1	0	4	0	0	0	2	0
Materials (individual/small)									
Rater 1	0	0	3	1	6	0	2	0	0
Rater 2	0	0	1	0	4	0	2	0	0
Diagnosis (large)									
Rater 1	0	0	0	0	0	0	0	0	1
Rater 2	0	0	1	0	0	0	1	0	1
Diagnosis (individual/small)									
Rater 1	0	1	3	1	4	0	5	0	0
Rater 2	0	0	0	0	2	0	0	0	0

Table D (continued)

Category/rater	Teacher								
	1	2	3	4	5	6	7	8	9
Evaluation (large)									
Rater 1	0	1	0	1	0	0	1	0	0
Rater 2	0	1	0	0	0	0	1	0	0
Evaluation (individual/small)									
Rater 1	0	0	1	0	0	0	0	0	0
Rater 2	0	0	1	0	0	0	1	0	0
Alternative procedures (large)									
Rater 1	0	0	0	0	0	0	0	0	0
Rater 2	0	0	0	0	0	0	0	0	0
Alternative procedures (individual/small)									
Rater 1	0	0	0	0	0	0	0	0	0
Rater 2	0	0	1	0	0	0	0	0	0

Table E
 Rater Frequencies for Lesson Plan Categories
 by Teacher for Day 5

Category/rater	Teacher								
	1	2	3	4	5	6	7	8	9
Objectives (large)									
Rater 1	2	0	1	0	0	0	0	0	0
Rater 2	1	0	1	0	0	0	0	0	0
Objectives (individual/small)									
Rater 1	0	0	0	0	3	0	0	0	0
Rater 2	0	0	0	0	2	0	0	0	0
Content (large)									
Rater 1	0	0	0	0	0	2	0	0	0
Rater 2	0	0	0	0	0	0	0	0	0
Content (individual/small)									
Rater 1	0	0	0	0	0	0	0	0	0
Rater 2	0	0	0	0	1	1	0	0	0
Activities (large)									
Rater 1	1	1	0	3	0	0	1	1	1
Rater 2	2	2	0	2	0	0	0	1	1
Activities (individual/small)									
Rater 1	0	0	3	0	5	0	4	0	0
Rater 2	0	0	3	0	5	0	5	0	0

Table E (continued)

Category/rater	Teacher								
	1	2	3	4	5	6	7	8	9
Instruction (large)									
Rater 1	4	1	0	1	0	1	0	0	0
Rater 2	1	1	0	1	0	1	0	0	0
Instruction (individual/small)									
Rater 1	0	0	1	0	1	0	3	0	0
Rater 2	0	0	1	0	1	0	1	0	0
Organization									
Rater 1	0	1	2	2	3	0	2	0	0
Rater 2	0	0	1	0	1	0	2	0	0
Materials (large)									
Rater 1	3	1	0	5	0	0	1	1	1
Rater 2	4	2	0	2	0	0	0	1	1
Materials (individual/small)									
Rater 1	0	0	2	0	4	0	4	1	0
Rater 2	0	0	1	0	4	0	3	1	0
Diagnosis (large)									
Rater 1	0	0	0	0	0	0	0	0	0
Rater 2	0	0	0	0	0	0	1	0	0
Diagnosis (individual/small)									
Rater 1	0	0	2	0	1	0	2	0	0
Rater 2	0	0	0	0	0	0	0	0	0

Table E (continued)

Category/rater	Teacher								
	1	2	3	4	5	6	7	8	9
Evaluation (large)									
Rater 1	0	0	0	1	0	0	0	0	0
Rater 2	0	0	0	1	0	0	0	0	0
Evaluation (individual/small)									
Rater 1	0	0	0	0	0	0	1	1	0
Rater 2	0	0	0	0	0	0	1	1	0
Alternative procedures (large)									
Rater 1	0	0	0	0	0	0	0	0	0
Rater 2	0	0	0	0	0	0	0	0	0
Alternative procedures (individual/small)									
Rater 1	0	0	0	0	0	0	0	0	0
Rater 2	0	0	0	0	0	0	0	0	0

Table F
 Rater Frequencies for Lesson Plan Categories
 by Teacher for Day 6

Category/rater	Teacher								
	1	2	3	4	5	6	7	8	9
Objectives (large)									
Rater 1	1	0	1	0	0	0	0	0	0
Rater 2	1	0	1	0	1	0	0	0	0
Objectives (individual/small)									
Rater 1	0	0	0	0	4	0	0	0	0
Rater 2	0	0	0	0	2	0	0	0	0
Content (large)									
Rater 1	1	0	2	0	0	2	0	0	0
Rater 2	1	0	1	0	0	0	0	0	0
Content (individual/small)									
Rater 1	0	0	0	0	1	0	0	0	0
Rater 2	0	0	0	0	0	2	1	0	0
Activities (large)									
Rater 1	0	1	2	5	0	0	0	1	2
Rater 2	2	1	1	2	1	0	0	1	2
Activities (individual/small)									
Rater 1	0	1	0	0	3	0	3	0	0
Rater 2	0	0	0	1	3	0	3	0	0

Table F (continued)

Category/rater	Teacher								
	1	2	3	4	5	6	7	8	9
Instruction (large)									
Rater 1	2	1	3	0	0	3	0	0	0
Rater 2	1	0	3	1	0	1	0	0	0
Instruction (individual/small)									
Rater 1	0	0	0	0	3	0	2	0	0
Rater 2	0	0	0	0	2	0	2	0	0
Organization									
Rater 1	1	0	0	1	0	0	1	0	0
Rater 2	1	0	1	1	0	0	1	0	0
Materials (large)									
Rater 1	1	0	2	5	0	0	0	2	1
Rater 2	1	1	2	4	1	0	0	1	1
Materials (individual/small)									
Rater 1	0	1	0	0	3	0	3	0	0
Rater 2	0	0	0	0	2	0	3	0	0
Diagnosis (large)									
Rater 1	0	0	2	1	0	0	0	0	0
Rater 2	0	0	0	0	0	0	0	0	0
Diagnosis (individual/small)									
Rater 1	0	0	0	0	1	0	0	0	0
Rater 2	0	0	0	0	0	0	0	0	0

Table F (continued)

Category/rater	Teacher								
	1	2	3	4	5	6	7	8	9
Evaluation (large)									
Rater 1	0	1	0	2	0	0	0	0	0
Rater 2	0	1	0	2	0	0	0	0	0
Evaluation (individual/small)									
Rater 1	0	0	0	0	0	0	0	0	0
Rater 2	0	0	0	0	0	0	0	0	0
Alternative procedures (large)									
Rater 1	0	0	0	0	0	0	0	0	0
Rater 2	0	1	0	0	0	0	0	0	0
Alternative procedures (individual/small)									
Rater 1	0	0	0	0	0	0	0	0	0
Rater 2	0	0	0	0	0	0	0	0	0

Table G
 Rater Frequencies for Lesson Plan Categories
 by Teacher for Day 7

Category/rater	Teacher								
	1	2	3	4	5	6	7	8	9
Objectives (large)									
Rater 1	1	0	1	0	0	0	0	0	0
Rater 2	1	0	1	0	0	0	0	0	0
Objectives (individual/small)									
Rater 1	0	0	0	0	4	0	0	0	0
Rater 2	0	0	0	0	4	0	0	0	0
Content (large)									
Rater 1	0	0	2	0	0	0	0	0	1
Rater 2	0	0	1	0	0	0	0	0	0
Content (individual/small)									
Rater 1	0	0	0	0	1	0	1	0	0
Rater 2	0	0	0	0	2	0	1	0	0
Activities (large)									
Rater 1	0	1	2	1	0	0	0	1	4
Rater 2	0	1	1	1	0	0	0	1	3
Activities (individual/small)									
Rater 1	0	0	1	0	3	0	4	0	0
Rater 2	0	0	1	2	2	0	4	0	0

Table G (continued)

Category/rater	Teacher								
	1	2	3	4	5	6	7	8	9
Instruction (large)									
Rater 1	3	1	2	2	0	3	0	0	0
Rater 2	3	1	2	1	0	3	0	0	0
Instruction (individual/small)									
Rater 1	0	0	0	0	1	0	3	0	0
Rater 2	0	0	0	0	1	0	2	0	0
Organization									
Rater 1	0	0	0	1	0	0	2	1	0
Rater 2	1	0	1	0	0	0	1	1	0
Materials (large)									
Rater 1	1	2	4	3	0	0	0	1	4
Rater 2	2	1	4	3	0	0	0	1	2
Materials (individual/small)									
Rater 1	0	0	1	0	5	0	3	0	0
Rater 2	1	0	0	0	5	0	0	0	0
Diagnosis (large)									
Rater 1	1	0	1	0	0	0	0	0	0
Rater 2	0	0	0	0	0	0	0	0	0
Diagnosis (individual/small)									
Rater 1	0	0	1	0	0	0	1	0	0
Rater 2	0	0	0	0	0	0	0	0	0

Table G (continued)

Category/rater	Teacher								
	1	2	3	4	5	6	7	8	9
Evaluation (large)									
Rater 1	1	0	0	0	0	0	0	1	0
Rater 2	1	0	0	0	0	0	0	1	0
Evaluation (individual/small)									
Rater 1	0	0	0	0	0	0	2	0	0
Rater 2	0	0	0	0	0	0	2	0	0
Alternative procedures (large)									
Rater 1	0	0	0	0	0	0	0	0	0
Rater 2	0	0	0	0	0	0	0	0	0
Alternative procedures (individual/small)									
Rater 1	0	0	0	0	0	0	0	0	0
Rater 2	0	0	0	0	0	0	0	0	0

Table H
 Rater Frequencies for Lesson Plan Categories
 by Teacher for Day 8

Category/rater	Teacher								
	1	2	3	4	5	6	7	8	9
Objectives (large)									
Rater 1	1	0	2	0	0	0	0	0	0
Rater 2	1	0	1	0	0	0	0	0	0
Objectives (individual/small)									
Rater 1	0	0	0	0	2	0	0	0	0
Rater 2	0	0	0	0	2	0	0	0	0
Content (large)									
Rater 1	0	0	2	0	0	0	0	0	0
Rater 2	0	0	2	1	0	0	0	0	1
Content (individual/small)									
Rater 1	0	0	0	0	0	0	3	0	0
Rater 2	0	0	0	0	0	0	3	0	0
Activities (large)									
Rater 1	2	0	1	2	0	0	0	2	0
Rater 2	3	2	2	2	0	0	0	1	1
Activities (individual/small)									
Rater 1	0	2	1	0	4	0	5	0	0
Rater 2	0	0	1	2	4	0	5	0	0

Table H (continued)

Category/rater	Teacher								
	1	2	3	4	5	6	7	8	9
Instruction (large)									
Rater 1	3	0	3	0	0	2	0	0	0
Rater 2	3	0	1	0	0	2	0	0	0
Instruction (individual/small)									
Rater 1	0	1	0	0	2	0	1	0	0
Rater 2	0	1	0	0	2	0	1	0	0
Organization									
Rater 1	2	2	0	1	0	0	1	0	0
Rater 2	2	1	0	0	0	0	1	0	0
Materials (large)									
Rater 1	2	0	1	2	0	1	1	2	0
Rater 2	4	0	1	1	0	1	0	2	0
Materials (individual/small)									
Rater 1	0	2	1	0	4	0	5	0	0
Rater 2	0	2	1	0	4	0	4	0	0
Diagnosis (large)									
Rater 1	0	0	1	0	0	0	0	0	0
Rater 2	0	0	0	0	0	0	0	0	0
Diagnosis (individual/small)									
Rater 1	0	0	0	0	0	0	1	0	0
Rater 2	0	1	0	0	0	0	0	0	0

Table H (continued)

Category/rater	Teacher								
	1	2	3	4	5	6	7	8	9
Evaluation (large)									
Rater 1	0	0	0	1	0	0	0	0	0
Rater 2	0	0	0	1	0	0	0	0	0
Evaluation (individual/small)									
Rater 1	0	1	0	0	0	0	0	0	0
Rater 2	0	1	0	0	0	0	0	0	0
Alternative procedures (large)									
Rater 1	0	0	0	0	0	0	0	0	0
Rater 2	0	0	0	0	0	0	0	0	0
Alternative procedures (individual/small)									
Rater 1	0	0	0	0	0	0	0	0	0
Rater 2	0	0	0	0	0	0	0	0	0

Table I
 Rater Frequencies for Lesson Plan Categories
 by Teacher for Day 9

Category/rater	Teacher								
	1	2	3	4	5	6	7	8	9
Objectives (large)									
Rater 1	1	0	1	0	0	0	0	0	0
Rater 2	1	0	1	0	0	0	0	0	0
Objectives (individual/small)									
Rater 1	0	0	0	0	1	0	0	0	0
Rater 2	0	0	0	0	1	0	0	0	0
Content (large)									
Rater 1	0	0	1	0	0	2	0	0	1
Rater 2	0	0	0	0	0	0	0	0	0
Content (individual/small)									
Rater 1	0	0	0	0	0	0	1	0	0
Rater 2	0	2	0	0	0	0	1	0	0
Activities (large)									
Rater 1	3	0	2	2	0	0	0	1	2
Rater 2	3	0	1	2	0	0	0	1	2
Activities (individual/small)									
Rater 1	0	2	1	0	9	0	5	0	0
Rater 2	0	2	1	0	5	0	6	0	0

Table I (continued)

Category/rater	Teacher								
	1	2	3	4	5	6	7	8	9
Instruction (large)									
Rater 1	3	0	1	0	0	3	0	0	0
Rater 2	0	0	1	0	0	3	2	0	0
Instruction (individual/small)									
Rater 1	0	0	1	0	0	0	1	0	0
Rater 2	0	0	1	0	0	0	0	0	0
Organization									
Rater 1	1	2	0	1	3	0	0	1	1
Rater 2	2	0	1	1	1	0	0	1	1
Materials (large)									
Rater 1	1	0	1	2	0	0	0	1	2
Rater 2	3	0	1	2	0	0	0	1	1
Materials (individual/small)									
Rater 1	0	2	1	0	6	0	5	1	0
Rater 2	0	2	0	0	4	0	6	0	0
Diagnosis (large)									
Rater 1	0	0	0	0	0	0	0	0	0
Rater 2	0	0	0	0	0	0	0	0	0
Diagnosis (individual/small)									
Rater 1	0	0	1	0	1	0	0	0	0
Rater 2	0	0	0	0	0	0	0	0	0

Table I (continued)

Category/rater	Teacher								
	1	2	3	4	5	6	7	8	9
Evaluation (large)									
Rater 1	2	0	0	0	0	0	0	0	0
Rater 2	2	0	0	0	0	0	0	0	0
Evaluation (individual/small)									
Rater 1	0	2	0	0	0	0	1	0	0
Rater 2	0	2	0	0	0	0	1	0	0
Alternative procedures (large)									
Rater 1	0	0	0	0	0	0	0	0	0
Rater 2	0	0	0	0	0	0	0	0	0
Alternative procedures (individual/small)									
Rater 1	0	0	0	0	0	0	0	0	0
Rater 2	0	0	0	0	0	0	0	0	0

Table J
 Rater Frequencies for Lesson Plan Categories
 by Teacher for Day 10

Category/rater	Teacher								
	1	2	3	4	5	6	7	8	9
Objectives (large)									
Rater 1	1	0	2	0	0	0	0	0	0
Rater 2	1	0	1	0	0	0	0	0	0
Objectives (individual/small)									
Rater 1	0	0	0	0	2	0	0	0	0
Rater 2	0	0	0	0	1	0	0	0	0
Content (large)									
Rater 1	0	0	1	0	0	0	0	1	0
Rater 2	0	0	0	0	0	0	0	0	2
Content (individual/small)									
Rater 1	0	0	0	0	1	0	2	0	0
Rater 2	0	2	0	0	1	0	2	0	0
Activities (large)									
Rater 1	2	0	1	2	0	2	0	1	2
Rater 2	1	0	1	2	0	2	0	2	0
Activities (individual/small)									
Rater 1	0	2	1	0	8	0	4	0	0
Rater 2	0	2	1	0	6	0	4	0	0

Table J (continued)

Category/rater	Teacher								
	1	2	3	4	5	6	7	8	9
Instruction (large)									
Rater 1	2	0	1	0	0	2	0	0	0
Rater 2	1	0	1	0	0	2	0	0	0
Instruction (individual/small)									
Rater 1	0	0	0	0	0	0	2	0	0
Rater 2	0	1	0	0	1	0	2	0	0
Organization									
Rater 1	1	2	0	2	2	0	1	0	1
Rater 2	1	0	0	0	2	0	2	0	1
Materials (large)									
Rater 1	1	0	2	3	0	0	0	3	2
Rater 2	1	0	2	3	0	0	0	1	2
Materials (individual/small)									
Rater 1	0	2	1	0	8	0	5	0	0
Rater 2	0	2	0	0	4	0	4	0	0
Diagnosis (large)									
Rater 1	0	0	0	0	0	0	0	0	0
Rater 2	0	0	0	0	0	0	0	0	0
Diagnosis (individual/small)									
Rater 1	0	0	0	0	0	0	1	0	0
Rater 2	0	0	0	0	0	0	0	0	0

Table J (continued)

Category/rater	Teacher								
	1	2	3	4	5	6	7	8	9
Evaluation (large)									
Rater 1	0	0	0	1	0	0	0	0	1
Rater 2	0	2	0	1	0	0	0	0	1
Evaluation (individual/small)									
Rater 1	0	2	0	0	0	0	1	0	0
Rater 2	0	0	0	0	0	0	1	0	0
Alternative procedures (large)									
Rater 1	0	0	0	0	0	0	0	0	0
Rater 2	0	0	0	0	0	0	0	0	0
Alternative procedures (individual/small)									
Rater 1	0	0	0	0	0	0	0	0	0
Rater 2	0	0	0	0	0	0	0	0	0

Table K
Average Lesson Plan Category Frequencies
by Teacher for Day 1

Category ^a	Teacher									Total
	1	2	3	4	5	6	7	8	9	
Objectives (large)	1.0 (20.0)	0.0 (0.0)	1.0 (7.4)	0.0 (0.0)	2.0 (15.4)	1.0 (22.2)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	5.0 (8.3)
Objectives (individual/small)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Contents (large)	0.0 (0.0)	0.0 (0.0)	0.5 (3.7)	0.0 (0.0)	1.0 (7.7)	0.0 (0.0)	1.0 (15.4)	0.0 (0.0)	0.5 (14.3)	3.0 (5.1)
Contents (individual/small)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Activities (large)	0.0 (0.0)	2.0 (28.6)	2.5 (18.5)	0.0 (0.0)	2.5 (19.2)	1.0 (22.2)	0.5 (7.7)	0.0 (0.0)	0.0 (0.0)	8.5 (14.5)
Activities (individual/small)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	1.5 (11.5)	0.0 (0.0)	0.5 (7.7)	0.0 (0.0)	0.0 (0.0)	2.0 (3.4)
Instruction (large)	2.0 (40.0)	0.0 (0.0)	3.0 (22.2)	2.5 (45.5)	0.5 (3.8)	1.0 (22.2)	1.5 (23.1)	0.0 (0.0)	1.0 (28.6)	11.5 (19.7)
Instruction (individual/small)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Organization	0.0 (0.0)	1.5 (21.4)	1.0 (7.4)	0.5 (9.1)	1.5 (11.5)	0.0 (0.0)	1.0 (15.4)	0.0 (0.0)	0.0 (0.0)	5.5 (9.4)
Materials (large)	2.0 (40.0)	2.5 (35.7)	4.0 (29.6)	2.5 (45.5)	2.5 (19.2)	1.5 (33.3)	0.5 (7.7)	0.0 (0.0)	2.0 (57.1)	17.5 (29.9)
Materials (individual/small)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	1.0 (7.7)	0.0 (0.0)	0.5 (7.7)	0.0 (0.0)	0.0 (0.0)	1.5 (2.6)
Diagnosis (large)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Diagnosis (individual/small)	0.0 (0.0)	0.0 (0.0)	0.5 (3.7)	0.0 (0.0)	0.5 (3.8)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	1.0 (1.7)
Evaluation (large)	0.0 (0.0)	1.0 (14.3)	1.0 (7.4)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	1.0 (15.4)	0.0 (0.0)	0.0 (0.0)	3.0 (5.1)
Evaluation (individual/small)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Alternative procedures (large)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Alternative procedures (individual/small)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Total	5.0 (8.3)	7.0 (12.0)	13.5 (23.1)	5.5 (9.4)	13.0 (22.2)	4.5 (7.7)	6.5 (11.1)	0.0 (0.0)	3.5 (6.0)	

^aPercentages (in parentheses) based on total number of planning statements.

Table L
Average Lesson Plan Category Frequencies
by Teacher for Day 2

Category ^a	Teacher									Total
	1	2	3	4	5	6	7	8	9	
Objectives (large)	1.0 (25.0)	0.0 (0.0)	1.0 (8.0)	0.0 (0.0)	1.0 (9.1)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	3.0 (4.8)
Objectives (individual/small)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Contents (large)	0.0 (0.0)	0.0 (0.0)	1.0 (8.0)	0.5 (3.9)	0.0 (0.0)	0.0 (0.0)	1.0 (10.3)	1.0 (28.6)	0.0 (0.0)	3.5 (5.6)
Contents (individual/small)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Activities (large)	0.0 (0.0)	1.0 (13.4)	1.0 (8.0)	3.0 (35.3)	2.0 (18.2)	1.0 (25.0)	1.0 (10.3)	0.0 (0.0)	1.0 (28.6)	10.0 (15.9)
Activities (individual/small)	0.0 (0.0)	0.0 (0.0)	1.3 (12.0)	0.0 (0.0)	0.3 (4.3)	0.0 (0.0)	1.3 (13.8)	0.0 (0.0)	0.0 (0.0)	3.3 (5.6)
Instruction (large)	1.5 (37.5)	2.5 (38.5)	1.0 (8.0)	1.0 (11.8)	3.0 (27.3)	2.0 (30.0)	1.0 (10.3)	0.5 (14.3)	0.5 (14.3)	13.0 (20.6)
Instruction (individual/small)	0.0 (0.0)	0.0 (0.0)	1.0 (8.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	1.0 (1.6)
Organisation	0.0 (0.0)	0.0 (0.0)	1.0 (8.0)	0.5 (3.9)	0.5 (4.3)	0.0 (0.0)	1.5 (13.8)	0.0 (0.0)	0.0 (0.0)	3.5 (5.6)
Materials (large)	1.5 (37.5)	2.0 (30.8)	1.5 (12.0)	3.3 (41.2)	4.0 (36.4)	1.0 (25.0)	0.0 (0.0)	2.0 (37.1)	2.0 (37.1)	17.3 (27.4)
Materials (individual/small)	0.0 (0.0)	0.0 (0.0)	1.5 (12.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	1.5 (13.8)	0.0 (0.0)	0.0 (0.0)	3.0 (4.8)
Diagnosis (large)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	1.0 (10.3)	0.0 (0.0)	0.0 (0.0)	1.0 (1.6)
Diagnosis (individual/small)	0.0 (0.0)	0.0 (0.0)	1.0 (8.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	1.0 (1.6)
Evaluation (large)	0.0 (0.0)	1.0 (15.4)	1.0 (8.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.5 (5.3)	0.0 (0.0)	0.0 (0.0)	2.5 (4.3)
Evaluation (individual/small)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.5 (5.3)	0.0 (0.0)	0.0 (0.0)	0.5 (0.8)
Alternative procedures (large)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.3)
Alternative procedures (individual/small)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.3)
Total	4.0 (6.3)	6.5 (10.3)	12.5 (19.8)	8.5 (13.5)	11.0 (17.3)	4.0 (6.3)	9.5 (15.1)	3.5 (5.6)	3.5 (5.6)	

^aPercentages (in parentheses) based on total number of planning statements.

Table M
Average Lesson Plan Category Frequencies
by Teacher for Day 3

Category ^a	Teacher									Total
	1	2	3	4	5	6	7	8	9	
Objectives (large)	1.0 (20.0)	0.0 (0.0)	1.0 (11.8)	0.0 (0.0)	2.0 (16.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	4.0 (6.8)
Objectives (individual/small)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Contents (large)	0.0 (0.0)	0.0 (0.0)	1.0 (11.8)	0.0 (0.0)	0.0 (0.0)	0.5 (16.7)	1.0 (11.8)	1.0 (25.0)	0.0 (0.0)	3.5 (5.9)
Contents (individual/small)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Activities (large)	0.0 (0.0)	1.5 (20.0)	1.0 (11.8)	1.5 (18.8)	2.0 (16.0)	1.0 (33.3)	2.5 (29.4)	1.0 (25.0)	1.0 (50.0)	11.5 (19.3)
Activities (individual/small)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.5 (6.3)	0.5 (4.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	1.0 (1.7)
Instruction (large)	2.0 (40.0)	2.0 (26.7)	1.5 (17.6)	1.0 (12.5)	3.5 (28.0)	1.0 (33.3)	0.5 (5.9)	0.0 (0.0)	0.0 (0.0)	11.5 (19.3)
Instruction (individual/small)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.5 (5.9)	0.0 (0.0)	0.0 (0.0)	0.5 (0.8)
Organization	0.0 (0.0)	0.0 (0.0)	1.0 (11.8)	0.5 (6.3)	1.0 (8.0)	0.0 (0.0)	1.5 (17.6)	0.0 (0.0)	3.0 (50.0)	4.0 (6.8)
Materials (large)	2.0 (40.0)	3.0 (40.0)	2.0 (23.3)	4.0 (50.0)	2.0 (16.0)	0.5 (16.7)	1.5 (17.6)	2.0 (50.0)	1.0 (50.0)	18.0 (30.3)
Materials (individual/small)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.5 (6.3)	1.0 (8.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	1.5 (2.5)
Diagnosis (large)	0.0 (0.0)	0.0 (0.0)	0.5 (5.9)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.5 (5.9)	0.0 (0.0)	0.0 (0.0)	1.0 (1.7)
Diagnosis (individual/small)	0.0 (0.0)	0.0 (0.0)	0.5 (5.9)	0.0 (0.0)	0.5 (4.0)	0.0 (0.0)	0.5 (5.9)	0.0 (0.0)	0.0 (0.0)	1.5 (2.5)
Evaluation (large)	0.0 (0.0)	1.0 (13.3)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	1.0 (1.7)
Evaluation (individual/small)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Alternative procedures (large)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Alternative procedures (individual/small)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Total	5.0 (8.5)	7.5 (12.7)	8.5 (14.4)	8.0 (13.6)	12.5 (21.2)	3.0 (5.1)	8.5 (14.4)	4.0 (6.8)	2.0 (3.4)	

^aPercentages (in parentheses) based on total number of planning statements.

Table N
Average Lesson Plan Category Frequencies
by Teacher for Day 4

Category ^a	Teacher									Total
	1	2	3	4	5	6	7	8	9	
Objectives (large)	1.0 (25.0)	0.0 (0.0)	1.0 (8.3)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	2.0 (2.8)
Objectives (individual/small)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	2.0 (11.1)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	2.0 (2.3)
Contents (large)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	1.0 (30.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	1.0 (1.4)
Contents (individual/small)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	1.0 (3.6)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	1.0 (1.4)
Activities (large)	1.0 (25.0)	1.5 (17.6)	0.0 (0.0)	2.5 (25.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	1.0 (28.6)	1.0 (40.0)	7.0 (9.9)
Activities (individual/small)	0.0 (0.0)	0.5 (3.9)	3.0 (25.0)	0.5 (5.0)	4.5 (25.0)	0.0 (0.0)	1.5 (15.0)	0.0 (0.0)	0.0 (0.0)	10.0 (14.2)
Instruction (large)	1.5 (37.3)	3.0 (35.3)	0.0 (0.0)	0.5 (5.0)	0.0 (0.0)	1.0 (30.0)	0.5 (5.0)	0.0 (0.0)	0.0 (0.0)	4.5 (9.2)
Instruction (individual/small)	0.0 (0.0)	0.0 (0.0)	1.5 (12.5)	0.5 (5.0)	1.5 (8.3)	0.0 (0.0)	0.5 (5.0)	0.0 (0.0)	0.0 (0.0)	4.0 (5.7)
Organization	0.0 (0.0)	0.0 (0.0)	1.0 (8.3)	1.5 (15.0)	1.0 (5.6)	0.0 (0.0)	1.0 (10.0)	1.0 (28.6)	0.0 (0.0)	5.5 (7.8)
Materials (large)	0.5 (12.5)	2.0 (23.5)	0.0 (0.0)	3.0 (30.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	1.5 (42.9)	0.5 (20.0)	7.5 (10.6)
Materials (individual/small)	0.0 (0.0)	0.0 (0.0)	2.0 (16.7)	0.5 (5.0)	5.0 (27.8)	0.0 (0.0)	2.0 (20.0)	0.0 (0.0)	0.0 (0.0)	9.5 (13.5)
Diagnosis (large)	0.0 (0.0)	0.0 (0.0)	0.5 (4.2)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.5 (5.0)	0.0 (0.0)	1.0 (40.0)	2.0 (2.4)
Diagnosis (individual/small)	0.0 (0.0)	0.5 (3.9)	1.5 (12.5)	0.5 (5.0)	3.0 (16.7)	0.0 (0.0)	2.5 (25.0)	0.0 (0.0)	0.0 (0.0)	8.0 (11.3)
Evaluation (large)	0.0 (0.0)	1.0 (11.8)	0.0 (0.0)	0.5 (5.0)	0.0 (0.0)	0.0 (0.0)	1.0 (10.0)	0.0 (0.0)	0.0 (0.0)	2.5 (3.5)
Evaluation (individual/small)	0.0 (0.0)	0.0 (0.0)	1.0 (8.3)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.5 (5.0)	0.0 (0.0)	0.0 (0.0)	1.5 (2.1)
Alternative procedures (large)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Alternative procedures (individual/small)	0.0 (0.0)	0.0 (0.0)	0.5 (4.2)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.5 (0.7)
Total	4.3 (5.7)	8.5 (12.1)	12.0 (17.0)	10.0 (14.2)	18.0 (25.5)	2.0 (2.8)	10.0 (14.2)	3.5 (5.0)	2.5 (3.3)	

^aPercentages (in parentheses) based on total number of planning statements.

Table 0
Average Lesson Plan Category Frequencies
by Teacher for Day 5

Category ^a	Teacher									Total
	1	2	3	4	5	6	7	8	9	
Objectives (large)	1.5 (16.7)	0.0 (0.0)	1.0 (11.1)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	2.5 (3.3)
Objectives (individual/small)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	2.5 (16.1)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	2.5 (3.3)
Contents (large)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	1.0 (40.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	1.0 (1.4)
Contents (individual/small)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.5 (3.2)	0.5 (20.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	1.0 (1.4)
Activities (large)	1.5 (16.7)	1.5 (33.3)	0.0 (0.0)	2.5 (27.8)	0.0 (0.0)	0.0 (0.0)	0.5 (3.2)	1.0 (25.0)	1.0 (50.0)	8.0 (11.3)
Activities (individual/small)	0.0 (0.0)	0.0 (0.0)	3.0 (33.3)	0.0 (0.0)	5.0 (32.3)	0.0 (0.0)	4.5 (29.0)	0.0 (0.0)	0.0 (0.0)	12.5 (17.6)
Instruction (large)	2.5 (27.8)	1.0 (22.2)	0.0 (0.0)	1.0 (11.1)	0.0 (0.0)	1.0 (40.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	5.5 (7.7)
Instruction (individual/small)	0.0 (0.0)	0.0 (0.0)	1.0 (11.1)	0.0 (0.0)	1.0 (6.5)	0.0 (0.0)	2.0 (12.9)	0.0 (0.0)	0.0 (0.0)	4.0 (5.6)
Organization	0.0 (0.0)	0.5 (11.1)	1.5 (16.7)	1.0 (11.1)	2.0 (12.9)	0.0 (0.0)	2.0 (12.9)	0.0 (0.0)	0.0 (0.0)	7.0 (9.9)
Materials (large)	3.5 (38.9)	1.5 (33.3)	0.0 (0.0)	3.5 (38.9)	0.0 (0.0)	0.0 (0.0)	0.5 (3.2)	1.0 (25.0)	1.0 (50.0)	11.0 (15.3)
Materials (individual/small)	0.0 (0.0)	0.0 (0.0)	1.5 (16.7)	0.0 (0.0)	4.0 (25.8)	0.0 (0.0)	3.5 (22.6)	1.0 (25.0)	0.0 (0.0)	10.0 (14.1)
Diagnosis (large)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.5 (3.2)	0.0 (0.0)	0.0 (0.0)	0.5 (0.7)
Diagnosis (individual/small)	0.0 (0.0)	0.0 (0.0)	1.0 (11.1)	0.0 (0.0)	0.5 (3.2)	0.0 (0.0)	1.0 (6.5)	0.0 (0.0)	0.0 (0.0)	2.5 (3.5)
Evaluation (large)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	1.0 (11.1)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	1.0 (1.4)
Evaluation (individual/small)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	1.0 (6.5)	1.0 (25.0)	0.0 (0.0)	2.0 (2.8)
Alternative procedures (large)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Alternative procedures (individual/small)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Total	9.0 (12.7)	4.5 (6.3)	9.0 (12.7)	9.0 (12.7)	15.5 (21.8)	2.5 (3.3)	15.5 (21.8)	4.0 (5.6)	2.0 (2.8)	

^aPercentages (in parentheses) based on total number of planning statements.

Table P
Average Lesson Plan Category Frequencies
by Teacher for Day 6

Category ^a	Teacher									Total
	1	2	3	4	5	6	7	8	9	
Objectives (large)	1.0 (15.4)	0.0 (0.0)	1.0 (9.5)	0.0 (0.0)	0.5 (3.7)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	2.5 (3.8)
Objectives (individual/small)	0.3 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	3.0 (22.2)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	3.0 (4.5)
Contents (large)	1.0 (15.4)	0.0 (0.0)	1.5 (14.3)	0.0 (0.0)	0.0 (0.0)	1.0 (25.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	3.5 (5.3)
Contents (individual/small)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.5 (3.7)	1.0 (25.0)	0.5 (5.3)	0.0 (0.0)	0.0 (0.0)	2.0 (3.0)
Activities (large)	1.0 (15.4)	1.0 (22.2)	1.5 (14.3)	3.5 (28.0)	0.5 (3.7)	0.0 (0.0)	0.0 (0.0)	1.0 (40.0)	2.0 (66.7)	10.5 (15.8)
Activities (individual/small)	0.0 (0.0)	0.5 (11.1)	0.0 (0.0)	0.5 (4.0)	3.0 (22.2)	0.0 (0.0)	3.0 (31.6)	0.0 (0.0)	0.0 (0.0)	7.0 (10.5)
Instruction (large)	1.5 (23.1)	0.5 (11.1)	3.0 (28.6)	0.5 (4.0)	0.0 (0.0)	2.0 (30.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	7.5 (11.3)
Instruction (individual/small)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	2.5 (18.5)	0.0 (0.0)	2.0 (21.1)	0.0 (0.0)	0.0 (0.0)	4.5 (6.8)
Organization	1.0 (15.4)	0.0 (0.0)	0.5 (4.8)	1.0 (8.0)	0.0 (0.0)	0.0 (0.0)	1.0 (10.5)	0.0 (0.0)	0.0 (0.0)	3.5 (5.3)
Materials (large)	1.0 (15.4)	0.5 (11.1)	2.0 (19.0)	4.5 (36.0)	0.5 (3.7)	0.0 (0.0)	0.0 (0.0)	1.5 (60.0)	1.0 (33.3)	11.0 (16.5)
Materials (individual/small)	0.0 (0.0)	0.5 (11.1)	0.0 (0.0)	0.0 (0.0)	2.5 (18.5)	0.0 (0.0)	3.0 (31.6)	0.0 (0.0)	0.0 (0.0)	6.0 (9.0)
Diagnosis (large)	0.0 (0.0)	0.0 (0.0)	1.0 (9.5)	0.5 (4.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	1.5 (2.3)
Diagnosis (individual/small)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.5 (3.7)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.5 (0.8)
Evaluation (large)	0.0 (0.0)	1.0 (22.2)	0.0 (0.0)	2.0 (16.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	3.0 (4.5)
Evaluation (individual/small)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Alternative procedures (large)	0.0 (0.0)	0.5 (11.1)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.5 (0.8)
Alternative procedures (individual/small)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Total	6.5 (9.8)	4.5 (6.8)	10.5 (15.8)	12.5 (18.3)	13.5 (20.3)	4.0 (6.0)	9.5 (16.3)	2.5 (3.8)	3.0 (4.5)	

^aPercentages (in parentheses) based on total number of planning statements.

Table Q
Average Lesson Plan Category Frequencies
by Teacher for Day 7

Category ^a	Teacher									Total
	1	2	3	4	5	6	7	8	9	
Objectives (large)	1.0 (12.5)	0.0 (0.0)	1.0 (7.7)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	2.0 (2.8)
Objectives (individual/small)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	4.0 (28.6)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	4.0 (5.3)
Contents (large)	0.0 (0.0)	0.0 (0.0)	1.5 (11.5)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.5 (7.1)	2.0 (2.8)
Contents (individual/small)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	1.5 (10.7)	0.0 (0.0)	1.0 (7.7)	0.0 (0.0)	0.0 (0.0)	2.5 (3.4)
Activities (large)	0.0 (0.0)	1.0 (28.6)	1.5 (11.5)	1.0 (14.3)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	1.0 (25.0)	3.5 (50.0)	8.0 (11.0)
Activities (individual/small)	0.0 (0.0)	0.0 (0.0)	1.0 (7.7)	1.0 (14.3)	2.5 (17.9)	0.0 (0.0)	4.0 (30.8)	0.0 (0.0)	0.0 (0.0)	8.5 (11.7)
Instruction (large)	3.0 (37.5)	1.0 (28.6)	2.0 (15.4)	1.5 (21.4)	0.0 (0.0)	3.0 (100)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	10.5 (14.3)
Instruction (individual/small)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	1.0 (7.1)	0.0 (0.0)	2.5 (19.2)	0.0 (0.0)	0.0 (0.0)	3.5 (4.8)
Organization	0.5 (6.3)	0.0 (0.0)	0.5 (3.8)	0.5 (7.1)	0.0 (0.0)	0.0 (0.0)	1.5 (11.5)	1.0 (25.0)	0.0 (0.0)	4.0 (5.3)
Materials (large)	1.5 (18.8)	1.5 (42.9)	4.0 (30.8)	3.0 (42.9)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	1.0 (25.0)	3.0 (42.9)	14.0 (19.3)
Materials (individual/small)	0.5 (6.3)	0.0 (0.0)	0.5 (3.8)	0.0 (0.0)	3.0 (35.7)	0.0 (0.0)	1.5 (11.5)	0.0 (0.0)	0.0 (0.0)	7.5 (10.3)
Diagnosis (large)	0.5 (6.3)	0.0 (0.0)	0.5 (3.8)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	1.0 (1.4)
Diagnosis (individual/small)	0.0 (0.0)	0.0 (0.0)	0.5 (3.8)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.5 (3.8)	0.0 (0.0)	0.0 (0.0)	1.0 (1.4)
Evaluation (large)	1.0 (12.5)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	1.0 (25.0)	0.0 (0.0)	2.0 (2.8)
Evaluation (individual/small)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	2.0 (15.4)	0.0 (0.0)	0.0 (0.0)	2.0 (2.8)
Alternative procedures (large)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Alternative procedures (individual/small)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Total	8.0 (11.0)	3.5 (4.8)	13.0 (17.9)	7.5 (9.7)	14.0 (19.3)	3.0 (4.1)	13.0 (17.9)	4.0 (5.3)	7.5 (9.7)	

^aPercentages (in parentheses) based on total number of planning statements.

Table R
Average Lesson Plan Category Frequencies
by Teacher for Day 8

Category ^a	Teacher									Total
	1	2	3	4	5	6	7	8	9	
Objectives (large)	1.0 (8.7)	0.0 (0.0)	1.5 (14.3)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	2.5 (3.5)
Objectives (individual/small)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	2.0 (16.7)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	2.0 (2.8)
Contents (large)	0.0 (0.0)	0.0 (0.0)	2.0 (19.0)	0.5 (7.7)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.5 (50.0)	3.0 (4.2)
Contents (individual/small)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	3.0 (19.4)	0.0 (0.0)	0.0 (0.0)	3.0 (4.2)
Activities (large)	2.5 (21.7)	1.0 (12.5)	1.5 (14.3)	2.0 (30.8)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	1.5 (42.9)	0.5 (50.0)	9.0 (12.4)
Activities (individual/small)	0.0 (0.0)	1.0 (12.5)	1.0 (9.5)	1.0 (15.4)	4.0 (33.3)	0.0 (0.0)	3.0 (32.3)	0.0 (0.0)	0.0 (0.0)	12.0 (16.8)
Instruction (large)	3.0 (26.1)	0.0 (0.0)	2.0 (19.0)	0.0 (0.0)	0.0 (0.0)	2.0 (66.7)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	7.0 (9.8)
Instruction (individual/small)	0.0 (0.0)	1.0 (12.5)	0.0 (0.0)	0.0 (0.0)	2.0 (16.7)	0.0 (0.0)	1.0 (6.5)	0.0 (0.0)	0.0 (0.0)	4.0 (5.6)
Organization	2.0 (17.4)	1.5 (18.8)	0.0 (0.0)	0.5 (7.7)	0.0 (0.0)	0.0 (0.0)	1.0 (6.5)	0.0 (0.0)	0.0 (0.0)	5.0 (7.0)
Materials (large)	3.0 (26.1)	0.0 (0.0)	1.0 (9.5)	1.5 (23.1)	0.0 (0.0)	1.0 (33.3)	0.5 (3.2)	2.0 (57.1)	0.0 (0.0)	9.0 (12.6)
Materials (individual/small)	0.0 (0.0)	2.0 (25.0)	1.0 (9.5)	0.0 (0.0)	4.0 (33.3)	0.0 (0.0)	4.5 (29.0)	0.0 (0.0)	0.0 (0.0)	11.5 (16.1)
Diagnosis (large)	0.0 (0.0)	0.0 (0.0)	0.5 (4.8)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.5 (0.7)
Diagnosis (individual/small)	0.0 (0.0)	0.5 (6.3)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.5 (3.2)	0.0 (0.0)	0.0 (0.0)	1.0 (1.4)
Evaluation (large)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	1.0 (15.4)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	1.0 (1.4)
Evaluation (individual/small)	0.0 (0.0)	1.0 (12.5)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	1.0 (1.4)
Alternative procedures (large)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Alternative procedures (individual/small)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Total	11.5 (16.1)	8.0 (11.2)	10.5 (14.7)	6.5 (9.1)	12.0 (16.8)	3.0 (4.2)	15.5 (21.7)	3.5 (4.9)	1.0 (1.4)	

^aPercentages (in parentheses) based on total number of planning statements.

Table S
Average Lesson Plan Category Frequencies
by Teacher for Day 9

Category ^a	Teacher									Total
	1	2	3	4	5	6	7	8	9	
Objectives (large)	1.0 (9.1)	0.0 (0.0)	1.0 (11.8)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	2.0 (2.7)
Objectives (individual/small)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	1.0 (6.5)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	1.0 (1.3)
Contents (large)	0.0 (0.0)	0.0 (0.0)	0.3 (5.9)	0.0 (0.0)	0.0 (0.0)	1.0 (25.0)	0.0 (0.0)	0.0 (0.0)	0.3 (10.0)	2.0 (2.7)
Contents (individual/small)	0.0 (0.0)	1.0 (12.5)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	1.0 (6.9)	0.0 (0.0)	0.0 (0.0)	2.0 (2.7)
Activities (large)	3.0 (27.3)	0.0 (0.0)	1.3 (17.6)	2.0 (40.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	1.0 (28.6)	2.0 (40.0)	9.3 (12.7)
Activities (individual/small)	0.0 (0.0)	2.0 (25.0)	1.0 (11.8)	0.0 (0.0)	7.0 (45.2)	0.0 (0.0)	5.3 (37.9)	0.0 (0.0)	0.0 (0.0)	15.3 (20.7)
Instruction (large)	1.3 (13.6)	0.0 (0.0)	1.0 (11.8)	0.0 (0.0)	0.0 (0.0)	3.0 (75.0)	1.0 (6.9)	0.0 (0.0)	0.0 (0.0)	6.3 (8.7)
Instruction (individual/small)	0.0 (0.0)	0.0 (0.0)	1.0 (11.8)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.3 (3.4)	0.0 (0.0)	0.0 (0.0)	1.3 (2.3)
Organization	1.3 (13.6)	1.0 (12.5)	0.3 (5.9)	1.0 (20.0)	2.0 (12.9)	0.0 (0.0)	0.0 (0.0)	1.0 (28.6)	1.0 (20.0)	8.0 (10.7)
Materials (large)	2.0 (18.2)	0.0 (0.0)	1.0 (11.8)	2.0 (40.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	1.0 (28.6)	1.3 (30.0)	7.3 (10.3)
Materials (individual/small)	0.0 (0.0)	2.0 (25.0)	0.3 (5.9)	0.0 (0.0)	3.0 (32.3)	0.0 (0.0)	5.3 (37.9)	0.3 (14.3)	0.0 (0.0)	13.3 (18.0)
Diagnosis (large)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Diagnosis (individual/small)	0.0 (0.0)	0.0 (0.0)	0.3 (5.9)	0.0 (0.0)	0.3 (3.2)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	1.0 (1.3)
Evaluation (large)	2.0 (18.2)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	2.0 (2.7)
Evaluation (individual/small)	0.0 (0.0)	2.0 (25.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	1.0 (6.9)	0.0 (0.0)	0.0 (0.0)	3.0 (4.0)
Alternative procedures (large)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Alternative procedures (individual/small)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Total	11.0 (14.7)	8.0 (10.7)	8.5 (11.3)	5.0 (6.7)	15.3 (20.7)	4.0 (5.3)	14.3 (19.3)	3.3 (4.7)	3.0 (6.7)	

^aPercentages (in parentheses) based on total number of planning statements.

Table T
Average Lesson Plan Category Frequencies
by Teacher for Day 10

Category ^a	Teacher									Total
	1	2	3	4	5	6	7	8	9	
Objectives (large)	1.0 (16.7)	0.0 (0.0)	1.5 (20.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	2.5 (3.3)
Objectives (individual/small)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	1.5 (8.3)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	1.5 (2.0)
Contents (large)	0.0 (0.0)	0.0 (0.0)	0.5 (6.7)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.5 (12.5)	1.0 (16.7)	2.0 (2.6)
Contents (individual/small)	0.0 (0.0)	1.0 (11.8)	0.0 (0.0)	0.0 (0.0)	1.0 (5.6)	0.0 (0.0)	2.0 (12.9)	0.0 (0.0)	0.0 (0.0)	4.0 (5.2)
Activities (large)	1.5 (25.0)	0.0 (0.0)	1.0 (13.3)	2.0 (28.6)	0.0 (0.0)	2.0 (30.0)	0.0 (0.0)	1.5 (37.5)	1.0 (16.7)	9.0 (11.8)
Activities (individual/small)	0.0 (0.0)	2.0 (23.5)	1.0 (13.3)	0.0 (0.0)	7.0 (38.9)	0.0 (0.0)	4.0 (25.8)	0.0 (0.0)	0.0 (0.0)	14.0 (18.3)
Instruction (large)	1.5 (25.0)	0.0 (0.0)	1.0 (13.3)	0.0 (0.0)	0.0 (0.0)	2.0 (30.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	4.5 (5.9)
Instruction (individual/small)	0.0 (0.0)	0.5 (5.9)	0.0 (0.0)	0.0 (0.0)	0.5 (2.8)	0.0 (0.0)	2.0 (12.9)	0.0 (0.0)	0.0 (0.0)	3.0 (3.9)
Organization	1.0 (16.7)	1.0 (11.8)	0.0 (0.0)	1.0 (14.3)	2.0 (11.1)	0.0 (0.0)	1.5 (9.7)	0.0 (0.0)	1.0 (16.7)	7.5 (9.8)
Materials (large)	1.0 (16.7)	0.0 (0.0)	2.0 (26.7)	3.0 (42.9)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	2.0 (30.0)	2.0 (33.3)	10.0 (13.2)
Materials (individual/small)	0.0 (0.0)	2.0 (23.5)	0.5 (6.7)	0.0 (0.0)	6.0 (33.3)	0.0 (0.0)	4.5 (29.0)	0.0 (0.0)	0.0 (0.0)	13.0 (17.0)
Diagnosis (large)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Diagnosis (individual/small)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.5 (3.2)	0.0 (0.0)	0.0 (0.0)	0.5 (0.7)
Evaluation (large)	0.0 (0.0)	1.0 (11.8)	0.0 (0.0)	1.0 (14.3)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	1.0 (16.7)	3.0 (3.9)
Evaluation (individual/small)	0.0 (0.0)	1.0 (11.8)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	1.0 (6.5)	0.0 (0.0)	0.0 (0.0)	2.0 (2.6)
Alternative procedures (large)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Alternative procedures (individual/small)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Total	6.0 (7.8)	8.5 (11.1)	7.5 (9.8)	7.0 (9.2)	18.0 (23.5)	4.0 (5.2)	15.5 (20.3)	4.0 (5.2)	6.0 (7.8)	

^aPercentages (in parentheses) based on total number of planning statements.

Table U
Average Total Lesson Plan Category
Frequencies by Teacher

Category ^a	Teacher									Total
	1	2	3	4	5	6	7	8	9	
Objectives (large)	10.3 (15.0)	0.0 (0.0)	11.0 (10.4)	0.0 (0.0)	5.5 (3.8)	1.0 (2.9)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	28.0 (4.1)
Objectives (individual/small)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	16.0 (11.2)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	16.0 (2.3)
Contents (large)	1.0 (1.4)	0.0 (0.0)	8.5 (8.1)	1.0 (1.3)	1.0 (0.7)	4.5 (13.2)	3.0 (2.3)	2.5 (7.7)	3.0 (8.3)	24.3 (3.6)
Contents (individual/small)	0.0 (0.0)	2.0 (3.0)	0.0 (0.0)	0.0 (0.0)	4.5 (3.1)	1.5 (4.4)	7.5 (6.4)	0.0 (0.0)	0.0 (0.0)	15.5 (2.3)
Activities (large)	10.3 (15.0)	10.3 (15.8)	11.5 (10.9)	20.0 (25.3)	7.0 (4.9)	3.0 (14.7)	4.5 (3.8)	9.0 (27.7)	13.0 (36.6)	91.0 (13.3)
Activities (individual/small)	0.0 (0.0)	6.0 (9.0)	11.5 (10.9)	3.5 (4.4)	35.5 (24.8)	0.0 (0.0)	29.5 (25.0)	0.0 (0.0)	0.0 (0.0)	86.0 (12.5)
Instruction (large)	20.0 (28.6)	10.0 (15.0)	14.5 (13.7)	8.0 (10.1)	7.0 (4.9)	18.0 (52.9)	4.5 (3.8)	0.5 (1.5)	1.5 (4.2)	84.0 (12.3)
Instruction (individual/small)	0.0 (0.0)	1.5 (2.3)	4.5 (4.3)	0.5 (0.6)	8.5 (5.9)	0.0 (0.0)	11.0 (9.3)	0.0 (0.0)	0.0 (0.0)	26.0 (3.7)
Organization	6.0 (8.6)	3.5 (8.3)	7.0 (6.6)	8.0 (10.1)	10.0 (7.0)	0.0 (0.0)	12.0 (10.2)	3.0 (9.2)	2.0 (5.6)	53.5 (7.8)
Materials (large)	18.0 (25.7)	13.0 (19.5)	17.5 (16.6)	30.5 (38.6)	9.0 (6.3)	4.0 (11.8)	3.0 (2.3)	14.0 (43.1)	14.0 (39.4)	123.0 (17.9)
Materials (individual/small)	0.5 (0.7)	6.5 (9.8)	7.5 (7.1)	1.0 (1.3)	33.5 (23.4)	0.0 (0.0)	26.5 (22.3)	1.5 (4.6)	0.0 (0.0)	77.0 (11.3)
Diagnosis (large)	0.5 (0.7)	0.0 (0.0)	3.0 (2.8)	0.5 (0.6)	0.0 (0.0)	0.0 (0.0)	2.5 (2.1)	0.0 (0.0)	1.0 (2.8)	7.5 (1.1)
Diagnosis (individual/small)	0.0 (0.0)	1.0 (1.5)	5.5 (5.2)	0.5 (0.6)	5.5 (3.8)	0.0 (0.0)	5.5 (4.7)	0.0 (0.0)	0.0 (0.0)	14.0 (2.5)
Evaluation (large)	3.0 (4.3)	6.0 (9.0)	2.0 (1.9)	5.5 (7.0)	0.0 (0.0)	0.0 (0.0)	2.5 (2.1)	1.0 (3.1)	1.0 (2.8)	21.0 (3.1)
Evaluation (individual/small)	0.0 (0.0)	4.0 (6.0)	1.0 (0.9)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	6.0 (5.1)	1.5 (3.1)	0.0 (0.0)	12.0 (1.3)
Alternative procedures (large)	0.0 (0.0)	0.5 (0.8)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.5 (0.1)
Alternative procedures (individual/small)	0.0 (0.0)	0.0 (0.0)	0.5 (0.5)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.5 (0.1)
Total	70.0 (10.2)	64.5 (9.7)	105.5 (15.4)	79.0 (11.5)	143.0 (20.9)	34.0 (5.0)	118.0 (17.3)	32.5 (4.8)	35.5 (5.2)	

^aPercentages (in parentheses) based on total number of planning statements.

Table V
Mean Percentages of Lesson Plan Category
Occurrence by Teacher^a

Category	Teacher								
	1	2	3	4	5	6	7	8	9
Objectives (large)	16.9	0.0	11.0	0.0	4.4	2.2	0.0	0.0	0.0
Objectives (individual/small)	0.0	0.0	0.0	0.0	11.0	0.0	0.0	0.0	0.0
Content (large)	1.5	0.0	8.1	1.4	0.8	15.7	3.8	6.6	9.8
Content (individual/small)	0.0	2.4	0.0	0.0	2.9	4.5	5.2	0.0	0.0
Activities (large)	13.1	17.8	10.9	24.9	5.7	13.1	5.1	25.3	39.2
Activities (individual/small)	0.0	7.8	11.3	4.5	23.5	0.0	22.6	0.0	0.0
Instruction (large)	30.8	16.2	13.6	11.1	5.9	53.7	5.1	1.4	4.3
Instruction (individual/small)	0.0	1.8	4.3	0.5	6.0	0.0	8.7	0.0	0.0

^aMeans calculated across days of instruction.

Table V (continued)^a

Category	Teacher								
	1	2	3	4	5	6	7	8	9
Organization	6.9	7.6	6.7	10.5	6.7	0.0	11.0	8.2	3.7
Materials (large)	26.4	21.7	16.3	39.1	7.5	10.8	3.2	39.6	37.4
Materials (individual/small)	0.6	8.5	7.1	1.1	22.2	0.0	20.5	3.9	0.0
Diagnosis (large)	0.6	0.0	2.8	0.4	0.0	0.0	2.5	0.0	4.0
Diagnosis (individual/small)	0.0	1.2	5.1	0.5	3.5	0.0	4.8	0.0	0.0
Evaluation (large)	3.1	8.9	1.5	6.2	0.0	0.0	3.1	2.5	1.7
Evaluation (individual/small)	0.0	4.9	0.8	0.0	0.0	0.0	4.6	2.5	0.0
Alternative procedures (large)	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Alternative procedures (individual/small)	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0

^aMeans calculated across days of instruction.

LESSON PLANS - TEACHER 1

Monday, Sept. 10, 1979

Motivation and Objective:

"Deception" angle of one rascal blaming another. Refer to TV program Get Set whereby detective Don Adams uses various disguises while remaining the same person. Lead to concept equivalent (value remains the same but form or symbol changes.) Write word on board; ask for root word. Lead to meaning: equal value. State objective: finding equivalent fractions.

Method:

Using fraction examples from student booklet p. 71B2 have students fold 8 x 11 paper into four parts. Draw dotted lines on folds and note $1/4$; $3/4$. Refold to eighths. Compare now by counting to arrive at $1/4 = 2/8$; $3/4 = 6/8$.

Repeat process on second piece of paper folding to thirds, then to ninths. Conclude $1/3 = 3/9$.

Repeat process on third paper folding to $1/2$. Ask students to now find ninths. Conclude impossible. Deduce reason why not all fractions have equivalents.

Tuesday, Sept. 11, 1979

Motivation and Objective:

Cartoon top of page 71A2. Attempt to catch rascals by changing sizes. Recognize the equivalent value in fractions regardless of difference in numbers used.

Method:

Use arrays on 71A2 to replace paper folding. Ask students to think of each in relation to yesterday's activity. Note process of dividing some arrays into smaller pieces while in others pieces are grouped to become a larger unit. Deduce multiplying or dividing concept.

Wednesday, Sept. 12, 1979

Motivation and Objective:

In our plan to outwit and capture rascals, some are still escaping. We need to review for some detectives ways to see through rascals disguises to recognize equivalent fractions.

Method:

Using a transparency with a like array for problem 1 p. 71A3 shade in $2/12$. Count above and emphasize lines which divide the array into sixths. Arrive at completion of each equivalent.

Repeat process for problems 2, 3, and 4 noting in problem 4 reversal of two equivalents, and the final one which cannot be done. Note reason why some fractions cannot compare in value. Deduce denominators must be multiplied or divided evenly.

Thursday, Sept. 13, 1979

Motivation and Objective:

Basil, the baker in cartoon p. 71A4 hopes to deceive rascals by using differently marked containers for his stock. He needs to know how to change to equivalents.

Method:

Draw a box for problem 1. Divide first into thirds; then ninths. Using shading, complete the comparison $3/9 = 1/3$. Repeat process for problems 2, 3, 4. Complete problems 5 and 6 without drawing an array if possible. Do p. 71A5 independently.

Friday, Sept. 14, 1979

Motivation and Objective:

While using arrays on the board and pictures in our booklets, today let's think of a simple rule we can use to change to equivalents so that we can speed up our work. (Change numerators in the same manner as denominators.)

Method:

Draw four arrays of eighths on board as in TE p. 12. Shade in half. Have students draw more lines to separate or circles to group parts. Count new amounts of pieces. Students should complete or realize the following combinations: $4/8 = 2/4$
 $4/8 = 1/2$ $4/8 = 8/16$ $4/8 = 12/24$. Conclude that multiplying or making more parts to the group is one method of forming equivalents while dividing or making less parts to the group is another method. Use student booklet p. 71B3 to review changing to equivalents. Use p. 71B4 to apply objective: making more than one equivalent to a given fraction. Play Fraco for application of skills.

Monday, Sept. 17, 1979

Motivation and Objective:

Relate to attitude level of Monday mornings. Some people feel lazy or sluggish as the cartoon characters on student booklet p. 71B5. We need to order fractions on this page. Some can be done by simple comparisons while others need to be changed to equivalents before comparing.

Method:

Review meanings of symbols $<$, $>$, $=$. Sort out fractions with like numerators beginning with no. 1. Draw on the board a representative figure for $2/3$ and $2/5$. Why is it easy to see the order for such fractions. (Larger the denominator, the smaller the piece sizes.) Note also problem 5, 6, 9. Note that the remaining problem must require an equivalent change first. Do problems 2, 4, 8 first as they require one conversion. Do problems 3 and 7 last as they require two. Allow time to complete bottom of page independently.

Tuesday, Sept. 18, 1979

Motivation and Objective:

Discuss our most favorite activities from last year's Lumberjack Days. Transfer ideas to the Pioneer Picnic on student booklet p. 71B6. We need to order these fractions to decide who would be the winner in each contest. Also determine previous fraction addition and subtraction skills.

Method:

Write the two fractions on the board for each exercise.

Decide whether we must convert one or both to equivalents.

Compare and order.

Allow time for students to work on p. 71C7 independently and without any preparation or introduction for diagnostic purposes in fraction addition or subtraction skills.

Discuss role of numerator vs. denominator in addition using picture examples or object categories as dogs, fish, birds, etc. Emphasize need to apply our conversion skills to achieve like denominators when necessary.

Wednesday, Sept. 19, 1979

Motivation and Objective:

What are some of the ways we sometimes react to our frustrations? Do we sometimes feel like tearing our papers? Today's problems are to make equivalents for some fractions so that we can then add them.

Method:

Tape on front board two choices for denominators for the following problems as a checkup for yesterday's work on p. 71C7.

Use torn paper in same manner as they will be visualizing on p. 71C8.

After choosing the correct denominator complete the equivalent and the open sentence.

Yellow - choices $\overline{10}$ or $\overline{5}$

Purple - choices $\overline{8}$ or $\overline{2}$

Blue - choices $\overline{12}$ or $\overline{4}$

Add additional problem $3/4 + 1/3 = \square$

Choices posted should be $\overline{4}$ or $\overline{3}$

Why will these not work? How will we arrive at a common denominator? Complete the problems noting the need to sometimes make two conversions. Review why Orange could be added directly.

Which others could also be done this way?

Allow 2-3 minutes to work p. 71C8. List fractions from left hand boxes on board. Ask students to identify the chosen other half paper containing the correct denominator to use.

Note reason why one blank box remained.

Allow 3-4 minutes to work on p. 71C9.

Thursday, Sept. 20, 1979

Motivation and Objective:

Refer to the TV ad whereby Mother Nature "plays tricks." Today's story problem page will be like a trick since it deals with Spring instead of Fall. We will be making open sentences and solving them.

Method:

For quick review check answers for p. 71C9 writing the three for each box on the board. Ask students to now complete the second directive on the page.

Proceed to page 71C7 of student guide. Discuss first meaning of open sentence. Write on board, as students develop each. Allow time for them to solve. Check answers and complete the open sentences.

Allow 3-4 minutes to work independently on p. 71C10 noting the wizard's directions.

Friday, Sept. 21, 1979

Motivation and Objective:

Discuss fun of playing games and the game of Domino in particular. Today's work will be to create Domino "spots" on blocks. The spots may be given to us either as a fraction or a mixed number. Our job will include thinking of the spots as either form. We will be changing fractions to equivalent mixed numbers or mixed numbers to equivalent fractions.

Method:

Using student booklet p. 71D11 go through the first example. As we continue have students use the blackboard to draw their arrays; one using circles, one using blocks. After students complete pictures in their booklets using either representation, complete the open sentences by counting the drawing markings. Allow time to work on p. 71D12.

LESSON PLANS - TEACHER 2

Monday, Sept. 10, 1979

1. Distribute the four pages of review on equivalent fractions.
(This was taken from the fourth grade book which most of the students had last year).
2. Correct this work in latter part of period - students will correct their own to learn from their mistakes.
3. Distribute the student guides and booklets. Allow time to browse and comment.

Tuesday, Sept. 11, 1979

1. Use the teaching suggestions on page 9 of the teacher's guide to introduce part 1 for activity 71A.
2. Have students turn to page 2 of their booklet. Tell them about the Fractional Rascals that were introduced in Topic 67.
3. Do the first three problems on page 2 together in class.
Assign pages 2 and 3. Remind students that some of the problems cannot be done. Correct these pages.

Wednesday, Sept. 12, 1979

Introduce part 2 - use the teaching suggestions found on page 11.

Have students go to the chalk board and show equivalent fractions using arrays.

Assign pages 4 and 5 in the student booklet.

Corrent these pages when students are completed.

Introduce part 3 - use the teaching suggestions on T-12.

Assign page 6 in the student booklet.

Thursday, Sept. 13, 1979

Correct page 6 and discuss any and all mistakes.

Introduce Activity 71B - use the teaching suggestions provided.

Do pages 2 and 3 in the student guide orally together in class.

Assign page 4 - move about the room making sure all students are on the "right track." The more able students may also help those needing it.

Friday, Sept. 14, 1979

Play the game "Fraco."

Distribute the 6 x 5 grid and explain how the game is played. Play this game for half of the period.

Note: "Fraco" takes the whole class period.

Monday, Sept. 17, 1979

Do pages 5 and 6 in the student guide orally together in class. Those students completing this work will be given additional activity sheets.

Correct 5 and 6 when all students are completed.

Tuesday, Sept. 18, 1979

Introduce Activity 71C - use teaching suggestions on T-17 and 18. Assign pages 7, 8 and 9 in student booklet.

Wednesday, Sept. 19, 1979

& will receive extra help and move much slower than the large group. Go over 7 and 8 in the guide - assign p. 8 in the booklet.

Large group - correct 7, 8 & 9 - discuss the mistakes and assign p. 10.

Thursday, Sept. 20, 1979

Large group - correct p. 10 - after an introduction students may begin working on pages 11-13 in the booklet.

Special - correct p. 8 - introduce and assign 9 & 10.

Friday, Sept. 21, 1979

Large group - correct and discuss 11-13. Introduce and assign 14-16.

Special group - correct 9 & 10 - introduce 11-13 and have students begin working on these pages.

LESSON PLANS - TEACHER 3

Lesson #1 9/10/79

Topic - finding equivalent fractions using an array picture.

Begin with brief discussion - on the meaning of fractions.

Use blackboard. Possibly use worksheet #32.

Define equivalent fractions. Begin discussion - use teacher manual page 9 to guide discussion. Use blackboard to show examples.

Do problem 1 from student manual page (2) together as a class. Assign completion of pages 2 and 3 in student manual.

Work together in 2's or 3's as assigned. (Better student with poor student.)

When finished use cards to draw pictures of problems on blackboard.

Correct student manual pages 2 and 3 together.

Lesson #2 9/11/79

Topic - finding equivalent fractions using an array picture.

Review lesson ideas as presented in lesson #1. Use blackboard. Go over common errors from pages 2 and 3.

Have students work problems on the board - use pictures if needed. (Four students at a time - give teacher help if needed.)

Students not at the board are to solve problems on individual cards. Distribute 4 cards to each student. Solve by drawing picture on the back,

When finished proceed to pages 4-6 in student manual.

Give teacher help as needed.

Lesson #3 9/12/79

Topic - finding equivalent fractions without using pictures.

Review yesterday's lesson by discussing common errors from pages 4-6 in student manual. (Use blackboard.)

Introduce use of multiplication and division for finding equivalent fractions.

Assign two worksheets for practice using the above concepts.

(Work in groups - better student in each group.)

Provide teacher assistance as needed.

Lesson #4 9/12/79

Topic - find equivalent fractions without the use of pictures.

Begin class by dividing group into two sections - based on present understanding of topic.

Group I - Better group - 10 in group. Administer 20 question quiz on finding equivalent fractions (fraction reduction to lowest terms).

Check papers when done - those that appear to understand will play the game Fraco. If some don't they will join Group II for extra help.

Group II - assign worksheet on finding equivalent fractions. Provide teacher assistance. When finished student guide pages 2-4 may be worked on.

Lesson #5 9/14/79

Topic - finding equivalent fractions

Begin by dividing group into two sections - based on understanding of the topic.

Group I - better group - enlarged by 4 from yesterday.

Start by using oral drill on finding equivalent fractions in lowest terms. The rest of the period the class will play the game Fraco. (Student caller)

Group II - assign worksheets as additional practice on finding equivalent fractions. Provide individual help as needed.

Lesson #6 9/17/79

Topic - ordering common fractions less than one.

Introduce the above topic by using the blackboard - use knowledge of equivalent fractions to help. Follow teacher's manual pages 15-16. Review meaning of $<$, $>$ and $=$ signs. Present method of finding equivalents by using a form of one-multiplication.

Assign student guide pages 5-6. Give help as needed. Student may help each other also.

Lesson #7 9/18/79

Topic - write and solve open sentences that involve joining and separating.

Review concepts from yesterday's lesson - ordering fractions - student guide pages 5-6.

Introduce open sentence topic as described above - use teacher's manual pages 17-19. Use blackboard or overhead projector.

Assign student manual pages 7-9. Give help as needed. Students may also help each other. Those who finish may read over page 10 in student manual - then do it if they are able to.

Lesson #8 9/19/79

Topics - solve addition and subtraction problems with fractions less than one. Find equivalents for common fractions and mixed numbers.

Review adding and subtraction problems with fractions less than one. Use blackboard.

Assign worksheet #76 - adding fractions - unlike denominators and worksheet #79 - subtracting fractions. Give individual help as needed. Students who finish - may work on student guide pages 7-8. Introduce finding equivalents for mixed numbers - use blackboard. Have students draw pictures to prove solutions - use blackboard.

Lesson #9 9/20/79

Topic - finding equivalent common fractions or mixed numbers.

Review and extend ideas concerning the above topic - build from yesterday's lesson. Use blackboard - select students to draw pictures proving solutions. Students at desks use scratch paper to show solutions.

Assign student booklet pages 11-13. Students who finish may proceed to pages 14-16. Work individually at the blackboard with students experiencing difficulty. Students having trouble at their seats may ask each other for help.

Lesson #10 9/21/79

Topics - finding equivalent fractions or mixed numbers. Solving problems involving mixed numbers - addition and subtraction.

Review and extend ideas concerning the above topic - build from yesterday's lesson. Use blackboard. Teacher's manual pages 22-25.

Assign student guide pages 14-16. Those past 16 may do student guide pages 17-18.

LESSON PLANS - TEACHER 4

Monday, 9/10/79 (Planning time 1 hour)

Distribute materials

Kids are grouped as follows: at least on Hi-motivation
 Hi-problem-solving in each; one Lo-motivation Lo-problem-solving;
 one Hi-Lo; one Lo-Hi; 2-assorted - 4 groups of 6 - 1 group of
 5 = 29 kids.

Discussion of what makes up a fraction - numerator/
 denominator - location

Use plastic fractional circles to introduce equivalency

$$1/1 = 2/2 = 3/3 = 4/4 = 6/6 = 8/8$$

Find what else = $1/2$; $1/3$; $2/3$

Use plain paper - fold in $1/2$ - color top. "How much is
 colored?" Fold in $1/2$ other direction. "How many sections? 4
 How many colored? 2"

Tuesday, 9/11/79 (Planning time 40 min.)Review paper folding using $2/3$ colored sections

Do color drawings on paper without folding

Use chart on p. 9 T.E.

Assign workbook p. 2 for in class with neighbor, then have
 group decide, then whole class share.

Assign p. 3 - homework individual.

Caution that some can't be done.

Wednesday, 9/12/79 (Planning time 30 min.)

Do 71A part 2 - have them dittoed and do on board.

Using arrays do workbook p. 4 in class - blocks on overhead.

Use game "Fraction Football" for those who finish.

Thursday, 9/13/79 (Planning time 30 min.)

Put paragraph on board p. 12 T.E. Assign workbook p. 6.

Those who get it correct find a game. Those who don't group and work with them on another game or activity. Do p. 5 in class with a partner 1st then assign p. 6.

Friday, 9/14/79 (Planning time 45 min.)

Correct page #6 student workbook

Use student guide p. 2 as example in class

Do p. 3 and 4 as a total group of 6

Play FRACO if time or ditto puzzle

Give students a choice of 4 or 5 activities (1-Fraction Football, 2-FRACO, 3-Matching, 4-Coloring Puzzle, 5-Mathignation

Monday, 9/17/79 (Planning time 30 min.)

Begin class by assigning guide page #3 to do as a group.

Correct and discuss.

Pass out small cubes to teach group

Have partners work on p. 4 (1-6) (not 7 & 8) then share with group.

Have groups exchange and try to find errors. Least amount of errors gets 1st choice of games, etc. Use cubes to test.

Play games and puzzles

Tuesday, 9/18/79 (Planning time 30 min.)

2nd - Use guide p. 5 get out circle pieces

1st - Have them use circles to solve:

3/4	☐	3/6	1/2	☐	5/8	2/3	☐	4/6
1/4	☐	2/6	1	☐	8/8	5/6	☐	7/8

3rd - Do p. 6 with partner then you may play games.

Wednesday, 9/19/79 (Planning time 20 min.)

Complete work not done on Tuesday.

Finish bottom 1/2 of p. 5 student guide

Have #10, #11 done by whole class

Rest done with partner

Correct

Introduce "Order Out" Game

Thursday, 9/20/79 (Planning time 20 min.)

Begin class with game period

Use 1 - "Fraco"

2 - "Order Out"

1 - "Three in a Row"

1 - "Hi Fraction" (SRA Company)

Last 10 minutes assign student guide p. 6 to be done independently by 3:00 p.m.

Friday, 9/21/79 (Planning time 45 min. including "comments")

Correct student guide p. 6

Put addition problems on board one at a time. Provide each group with 2 sets of number card 1-12. Have the group decide what the answer should be. Then on a signal display all groups answers. Each correct answer earns 1 pt. Team with most points gets first choice at games.

Do workbook p. 7 if time (don't push).

LESSON PLANS - TEACHER 5

Monday, Sept. 10, 1979

Objective: Child recognizes fractional parts of a whole.

Introduce the idea of a fraction being part of a whole. Together the class will identify and shade in various fractional parts of geometric figures on a study sheet. Students will then do some of these exercises independently.

Objective: Child finds equivalent common fractions by using fractional pieces in a fraction kit.

Students will use a fraction kit containing one whole, $\frac{2}{2}$ s, $\frac{3}{3}$ s, $\frac{4}{4}$ s, $\frac{6}{6}$ s, $\frac{8}{8}$ s, and $\frac{9}{9}$ s to recognize equivalent fractions. Students will use the pieces to determine if two fractions are equivalent or which fraction would be equivalent to another. After working together in a group, students will use the fraction kit to find equivalent fractions on a study sheet. All students will do first part. Faster students will use fraction kits to solve last parts. They will determine if a first fraction is =, <, or > than a second fraction.

Tuesday, Sept. 11, 1979

Objective: Child uses array pictures to find equivalent fractions.

Using an overhead projector we will discuss using an array picture to find an equivalent fraction. We will do problems 1-3 in student's booklet p. 2 together. Students will then complete p. 2 independently.

Using the overhead projector we will discuss shading, combining, and dividing a given picture to find an equivalent fraction. Problem 1 will be done together and students will then complete p. 3 in the student's booklets independently.

Wednesday, Sept. 12, 1979

Objective: Child uses an array picture to find an equivalent fraction.

Using the blackboard, we will review using an array picture to find an equivalent fraction. We will do problems 2-3 together on p. 3 in student's booklets. Students will then be given time to do problem 4 independently. Students who have finished problem 4 will be given two teacher made activity sheets. These sheets will be a bit more difficult.

Objective: Child draws an array picture of his own to find equivalent fractions.

Using the blackboard, we will discuss using our own array pictures to find equivalent fractions. Children will use the rest of the period to begin solving the problems on pp. 4-5-6 in student booklets. Booklets will be collected at end of period.

Thursday, Sept. 13, 1979

Group will be divided into three smaller groups,

Gr. 3 -

Because of difficulty in working with picture arrays,

will be given teacher-made activity sheets. He will use fractional pieces in fraction kit to gain practice in recognizing equivalent fractions.

Gr. 2

Objective: Child draws an array picture of his own to find equivalent fractions.

These students need more practice in drawing picture arrays to find equivalent fractions. We will do two problems together to review the concept. Students will then be given time to continue working on pp. 4-5-6 in student booklets. Additional teacher made activities will be provided for those who finish.

Gr. 1

Objective: Child finds equivalent fraction without drawing a picture.

These children seem to understand well how to draw a picture array to find equivalent fractions. They will continue their work on pp. 4-5-6 in student booklets and may begin pp. 2-3-4 in student guide.

During the class period we will discuss how to find equivalent fractions without using a picture. Some children in this group are already doing so.

Friday, Sept. 14, 1979

Gr. 3 will be taken from group 2. He and will now work together. They will use the fraction pieces to find equivalent fractions and to identify fractions which are $<$, $>$ and $=$ to each other.

Gr. 2

Objective: Child finds equivalent fractions using array pictures.

Child finds equivalent fractions symbolically.

During first part of period students will continue to find equivalent fractions with array pictures. During last part of period children will discuss with teacher how to find equivalent fraction symbolically. Teacher made activity sheets will be used by students to practice this skill. Students may begin pp. 2-3-4 in student guide.

Gr. 3

Objective: Children use finding equivalent fractions mentally to play Fraco.

During the first part of the period Fraco will be introduced to the students by the teacher. Children will use the rest of the period to play Fraco.

Monday, Sept. 17, 1979

Gr. 3

Objective: Child uses array pictures to find equivalent fractions.

Students will be provided with teacher made activity sheets. They will have pictures drawn on them which the students will use to find equivalent fractions.

Gr. 1 and 2

Objective: Students review finding equivalent fractions symbolically.

Objective: Students are able to order two fractions of less than one.

Using the blackboard, these two groups will review finding equivalent fractions symbolically. We will then discuss how finding equivalent fractions helps us to order two fractions of less than one. They will begin working on Student Guide pp. 5-6.

Gr. 1

Objective: Child adds and subtracts two fractions each of which are less than one.

Students are introduced to adding and subtracting fractions with common denominators. When they understand the concept, they will be shown how finding equivalent fractions enables one to add and subtract fractions with unlike denominators. They will begin Student Booklet pp. 7-10.

Tuesday, Sept. 18, 1979

Gr. 3

Objective: Child will find equivalent fractions by using teacher made pictures.

and will work together to find equivalent fractions using pictures. They will use teacher made activity sheets and fraction kits.

Gr. 1-2

Objective: Child reviews ordering fractions less than one.

Together we will work "ordering fraction" problems on the board.

Gr. 2

Objective: Child orders two fractions less than one.

Students continue working on Student Guide pp. 5-6.

Gr. 1

Objective: Child adds and subtracts fractions of less than one.

Together we'll review adding and subtracting fractions on the blackboard. Students will then continue working in student booklets pp. 7-10.

Wednesday, Sept. 19, 1979

Gr. 3

Objective: Child divides and combines array pictures to find equivalent fractions.

Students will work on teacher made activity sheets to find

equivalent fractions. They now will have to divide and combine the array pictures to find equivalent fractions.

Gr. 2

Objective: Child adds and subtracts fractions of less than one.

We will review ordering fractions at the blackboard. We will discuss adding and subtracting fractions of less than one. Students will work on teacher made activity sheets adding and subtracting fractions. Fractions with like and unlike fractions will be solved.

Gr. 1

Continues working on pp. 7-10 in student booklet. Some will begin pp. 7-8 in student guide. On these papers they begin writing open sentences for story problems and solving them.

Thursday, Sept. 20, 1979

Gr. 3

Objective: Child draws his own array picture to find equivalent fractions.

and will draw their own array pictures on teacher made activity sheets to find equivalent fractions.

Gr. 1-2

Students will go to blackboard and review adding and subtracting fractions. When not at the blackboard they will solve the problems at their desks. Group will also write open sentences

with fractions for story problems.

Gr. 2

During the worktime they will finish yesterdays activity sheets and begin pp. 7-8-9 in student booklets.

Gr. 1

Students will finish pp. 7-10 in student booklets and all will begin pp. 7-8 in student guide. and will begin working on mixed numbers on pp. 11-12-13 in student booklets.

Friday, Sept. 21, 1979

Gr. 3

Objective¹: Child draws own array picture to find equivalent fractions.

Objective²: Child adds and subtracts fraction of less than one with like denominators.

and will work on teacher made activity sheets. For the first time they will be adding and subtracting fractions with like denominators.

Gr. 1-2

Review all 4 objectives listed on p. 6 of Teachers Guide. Student will solve several examples of each kind of problem. Solutions will be discussed after each problem is solved,

Gr. 2

During work time students will finish pp. 7-8-9 in student booklets. Some may start pp. 7-8 in Student Guide.

Gr. 1

Students finish pp. 7-8 in Student Guide.

will join

and in working on pp. 11-13 in student booklets.

will begin pp. 14-16 in student booklets. A few other students in this group may begin student booklet pp. 11-13 before period ends.

LESSON PLANS - TEACHER 6

Lesson I

EQUIVALENT FRACTIONS

A. Concept of equivalent developed by using picturesEX: $1/3 = \frac{\quad}{6}$ That is

B. Establish that equivalent fractions represent equal amounts.

EX: would you rather have $1/3$ of this treat or
 $2/3$ of it?

ON THE BOARD DRILL

1. Draw a rectangular picture showing
- $2/3$
- .

Using same picture - change it to show $4/6$.

2. Same as 1 only use
- $1/4$

and $2/8$.

3. Same as 1 only use
- $2/5$

and $8/20$.

4. Draw a rectangular picture (teacher) showing

 $8/10$ - who can change it to show $4/5$?

5. Same as 5 only use
- $6/12$
- and
- $3/6$
- .

6. Same as 5 only use
- $3/9$
- and
- $1/3$
- .

Do pages 2, 3 Topic 71 Common Fractions.

Lesson II

LOWEST TERMS

1. Short review on board for Lesson I

Use:

$$\frac{2}{3} = \frac{\boxed{}}{6}, \quad \frac{4}{10} = \frac{\boxed{}}{10}, \quad \frac{4}{12} = \frac{\boxed{}}{6}$$

2. Teach the use of common factors

Find factors of

15	1 X 15, (3) X 5
18	1 X 18, 2 X 9, (3) X 6
8	1 X 8, 2 X (4)
12	1 X 12, 2 X 6, 3 X (4)

Then

$$\frac{15}{18} \div 3 = \frac{5}{6}$$

$$\frac{8}{12} \div 4 = \frac{2}{3}$$

Do sheet on lowest terms

Lesson III

LOWEST TERMS

1. Review - finding factors and choosing common factors.

$$\frac{4}{10} \quad \frac{1}{1} \times \frac{4}{10}, \quad \frac{\textcircled{2}}{\textcircled{2}} \times \frac{2}{2}$$

Then

$$\frac{4}{10} \div \frac{2}{2} = \frac{2}{5}$$

2. Do p. 78 sheet.

Lesson IV

ADDITION OF UNLIKE FRACTIONS

1. Teach multiples: 4 $\overbrace{4, 8, 12, 16, 20, 24}^{\text{multiples}} \dots$

and 6

and 8

and 3

2. Common multiples: lowest

4 = 4, 8, (12) 16, 20, 24 . . .

3 = 2, 6, (12) 15, 18, 21 . . .

SO

$$3. \quad \frac{1}{4} \times = \frac{\quad}{12}$$

$$+ \frac{1}{3} \times = \frac{\quad}{12}$$

$$4. \quad \frac{1}{4} \times = \frac{3}{12}$$

$$+ \frac{1}{3} \times = \frac{4}{12}$$

$$\frac{7}{12}$$

Be sure all answers in lowest terms.

Lesson V

SAME AS LESSON IV

1. Review finding lowest common multiples converting to fractions with like denominators - Add & Subtract.

Lesson VI

ADDING MIXED NUMBERS

1. Review lessons IV and V

$$\begin{array}{r} \text{Use: } \frac{1}{2} \quad \frac{7}{10} \quad \frac{3}{4} \\ + \frac{3}{8} \quad + \frac{2}{5} \quad - \frac{3}{8} \end{array}$$

$$\begin{array}{r} \text{Use: } \frac{2}{3} \quad \frac{1}{2} \quad \frac{6}{8} \\ - \frac{1}{6} \quad - \frac{3}{10} \quad - \frac{1}{4} \end{array}$$

Answer in lowest terms

2. Introduce the whole number + fraction.

$$2 \frac{1}{2} = \text{two circles and one half-shaded circle}$$

$$1 \frac{1}{4} = \text{one circle and one quarter-shaded circle}$$

3. Add and Subtract using mixed numbers - no regrouping.

EX, (to be copied)

$$3 \frac{1}{2} \times \frac{4}{4} = \frac{4}{8}$$

$$+ 1 \frac{1}{8} \times \frac{1}{1} = \frac{1}{8}$$

$$4 + \frac{5}{8} = 4 \frac{5}{8}$$

Lesson VII PROPER & IMPROPER FRACTIONS (REGROUPING)

$$1. \quad 2 \frac{3}{4} = \begin{array}{|c|c|} \hline 1 & 3 \\ \hline 2 & 4 \\ \hline \end{array} \quad \begin{array}{|c|c|} \hline 5 & 7 \\ \hline 6 & 8 \\ \hline \end{array} \quad \begin{array}{|c|c|} \hline 9 & 11 \\ \hline 10 & \text{shaded} \\ \hline \end{array} + \frac{11}{4}$$

$$1 \frac{1}{3} = \begin{array}{|c|c|} \hline 1 & 2 \\ \hline 3 & \\ \hline \end{array} \quad \begin{array}{|c|} \hline 4 \\ \hline \end{array} = \frac{4}{3}$$

2. Multiplication-Addition method

$$2 \frac{3}{4} = \begin{array}{c} 8 \\ 2 \end{array} \xrightarrow{+3 \quad 11} \frac{11}{4}$$

$\textcircled{\times 4}$

$$1 \frac{1}{3} = \begin{array}{c} 1 \\ 1 \end{array} \xrightarrow{+1 \quad 5} \frac{5}{4}$$

$\textcircled{\times 4}$

3. Changing back to a mixed number

$$\frac{X}{Z} = Z \overline{)X} \quad \begin{array}{l} \text{(the line means } \div) \\ \text{(top } \div \text{ bottom)} \end{array}$$

$$\frac{11}{4} = \begin{array}{r} \textcircled{2} \text{ r } \textcircled{3} \\ \textcircled{4} \overline{)11} \\ \underline{-8} \\ 3 \end{array} = 2 \frac{3}{4}$$

$$\frac{5}{4} = \begin{array}{r} \textcircled{1} \text{ r } \textcircled{1} \\ \textcircled{4} \overline{)5} \\ \underline{-4} \\ 1 \end{array} = 1 \frac{1}{4}$$

Lesson VIII

1. Review - by using examples on the board. Use volunteers to do parts of problems.

$$\frac{1}{3}$$

$$+ \frac{1}{3}$$

$$\frac{5}{11}$$

$$+ \frac{2}{11}$$

$$\frac{9}{12}$$

$$+ \frac{1}{13}$$

$$\frac{1}{2}$$

$$- \frac{3}{8}$$

$$\frac{7}{10}$$

$$- \frac{2}{5}$$

$$\frac{3}{4}$$

$$- \frac{3}{8}$$

$$\frac{6}{8}$$

$$- \frac{1}{4}$$

$$3 \frac{1}{8}$$

$$+ 1 \frac{2}{8}$$

$$3 \frac{1}{8}$$

$$+ 1 \frac{1}{8}$$

$$3 \frac{1}{2}$$

$$+ 1 \frac{1}{4}$$

$$4 \frac{1}{6}$$

$$+ 1 \frac{1}{3}$$

2. Show $6 \frac{5}{6} \times 2 = \frac{10}{12}$

$$+ 3 \frac{1}{4} \times 3 = \frac{3}{12}$$

$$9 + \frac{13}{12} = 9 \frac{13}{12} = 9 + 1 + \frac{1}{12} = 10 \frac{1}{12}$$

Lesson IX

WHOLE NUMBERS TO FRACTIONS

1. $2 = \frac{\quad}{4}$

$$\begin{array}{|c|c|} \hline 1 & 2 \\ \hline 3 & 4 \\ \hline \end{array} \quad \begin{array}{|c|c|} \hline 5 & 6 \\ \hline 7 & 8 \\ \hline \end{array} = \frac{8}{4}$$

If $1 = \frac{3}{3}$ then $8 = \frac{?}{3}$

2. The whole number "over" one

$$\frac{2}{1} \times \frac{4}{4} = \frac{\quad}{4}$$

$$3 = \frac{\quad}{5}$$

$$6 = \frac{\quad}{7}$$

3. The improper fraction to whole number

$$2 = \frac{2}{1} \times \frac{4}{4} = \frac{8}{4} \div \frac{4}{4} = \frac{2}{1} = 2$$

Lesson X

SUBTRACTION & "BORROWING"

$$1. \quad \begin{array}{r} 1 \\ - \frac{1}{4} \end{array} \quad \text{if } 1 = \frac{4}{4} \quad \text{then} \quad \begin{array}{r} 0 \\ 1 \end{array} = \frac{4}{4}$$

$$\begin{array}{r} - \frac{1}{4} \\ \hline \end{array}$$

Practice: do

$$\begin{array}{r} 3 \\ - \frac{1}{2} \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ - \frac{1}{3} \\ \hline \end{array}$$

$$2. \quad 6 \frac{1}{4} = 5 + \frac{4}{4} + \frac{1}{4} = 5 \frac{5}{4}$$

$$\begin{array}{r} - \frac{3}{4} = \quad - \frac{3}{4} = \frac{3}{4} \\ \hline \end{array}$$

$$5 \frac{1}{4}$$

Practice: do

$$3 \frac{3}{8}$$

show

$$4 \frac{1}{4} = 4 \frac{3}{12} = ?$$

$$\begin{array}{r} - 1 \frac{5}{8} \\ \hline \end{array}$$

$$\begin{array}{r} - 2 \frac{1}{3} = 2 \frac{4}{12} = ? \\ \hline \end{array}$$

LESSON PLANS - TEACHER 7

Monday, Sept. 10, 1979

Introduce fractions - use Stich-Vaughn Succeeding in Mathematics pp. 110, 111, 112. Give practice examples on board. Work in small groups on pages. When finished correct orally and discuss.

Tuesday, Sept. 11, 1979

The class needs much more work on basic review of fractions.

Work in small groups using fraction discs. List problems on the board and have the groups solve problems.

Introduce equivalent fractions. Have small groups work on DMP Student Booklet pages 2-3. When groups have completed assignment correct orally and discuss examples.

Wednesday, Sept. 12, 1979

1. Review fractions and equivalent fractions.
2. Complete Student Booklet page 4 as a whole group activity.
3. Assign Student Booklet pp. 5-6. Have class work individually. If they have difficulty student should ask help of a classmate or me.
4. Work with those individuals who continue to have difficulty.

Thursday, Sept. 13, 1979

1. Give a 5-10 problem quiz to find those who continue to have difficulty (Put problems on the board).
2. Prepare a review worksheet for those who have problems.

3. Prepare Fraco-Game-Those who have mastered equivalent fractions can play Fraco. Work with those having problems. I am going to split the class into two groups. Heterogeneous grouping is not working. Many students have mastered the concepts and we are ready to proceed while others continue to have difficulty and need more practice.

Group I

Group II

1. Group I has mastered the concept of equivalent fractions. Have them begin the class playing Fraco.
2. Group II - Put more examples of equivalent fractions on the board, orally discuss and make drawings. Use fraction discs and cm cubes to prove equivalents.

3. Prepare a practice worksheet and have the class work individually or in pairs.

4. Meet with Group I

Introduce Student Guide pages 2, 3, 4. Assign -

5. Given individual help as needed.

6. Group II - Bring the group back together to correct work.

Monday, Sept. 17, 1979

1. Group II - Begin class period playing Fraco.

2. Group I - Discuss ordering in fractions, put examples on the board. Compare fractions with like denominators, like numerators, and unlike fractions. Assign Student Guide pages 5-6.

3. Group II - Bring class together. Discuss the first two problems on Student Guide pages 2-3. Assign rest of the problems.

Tuesday, Sept. 18, 1979

1. Group II - Work in small groups on Student Guide p. 4.

2. Group I - Introduce addition and subtraction of fractions.

Work problems on board. Do Student Booklet pages 7 together.

Assign Student Booklet pages 8, 9.

3. Group II - Correct and discuss Student Guide p. 4. Discuss ordering of fractions. Assign Student Guide pages 5-6.

4. Group I - Meet and correct if completed. Discuss any problems which are causing difficulty.

Wednesday, Sept. 19, 1979

Prepare game 50 wins. It is a good review of all concepts taught. DMP Games - Two Thirds, Fraction Fortune, Three-In-A-Row, Order Out.

Group I - Play any of the above games.

Group II - Review fraction order sentences. Introduce addition and subtraction of fractions. Do Student Guide p. 7 together.

Assign p. 8-9. Work in small groups or individually.

Group I - Review addition and subtraction of fractions. Assign Student Guide pp. 7-8 and Student Booklet p. 10.

Group II - Assign Student Guide p. 7. Give individual help as needed.

Thursday, Sept. 20, 1979

Group II - Begin class with fraction games.

Group I - Introduce mixed numbers. Work Student Booklet p. 11.

Problems A-B-C-D. Assign pp. 11, 12, 13.

Group II - Student Guide p. 8 problem solving. Work orally and discuss. Assign Student Booklet p. 10.

Group I - Correct and discuss Student Booklet pp. 11, 12, 13.

Assign 14, 15, 16.

Friday, Sept. 21, 1979

Group I - Work in two small groups on pages 9, 10, 11 of the Student Guide. Help those having trouble.

Group II - Review addition and subtraction of fractions.

Introduce mixed numbers. Practice drawing on the board.

Assign Student Booklet pages 11-12.

Group I - Correct pages 9, 10, 11. Discuss Student Guide pages

12-13. Assign Student Booklet pages 17-18.

LESSON PLANS - TEACHER 8

Tuesday, 9/11/79

Reviews 71A workbook 3. Review denominators name size of part - use foam blocks - equal part use cm cubes.

Wednesday, 9/12/79

Review - equal fractional parts. Do p. 4 & 5 of student workbook using cm cubes to double check - answer.

Thursday, 9/13/79

Sort cuisenaire rods. Children to work equivalent using rods only. to be working alone - ahead of class.

Friday, 9/14/79

Correct work (pp. 4-6 in pupil workbook) - Rest of class work using rods = fractions.

Monday, 9/17/79

Class do p. 4 & 5 using rods for proving problem.

Tuesday, 9/18/79

Correct books. joins . Multiplication/division review sheet.

Wednesday, 9/19/79

Text p. 6. Duplicated book pp. 2 & 3 & 4.

Thursday, 9/20/79

2 fractional Rascal Raids

3 Gnawing Knute

4 Balloons

Fraco game 6-7

Group

Group

Group

Duplicated Book p. 2-3-4-5-6

Friday, 9/21/79

Begin mixed fractions 71-D (cuissenaire rods)

Workbook p. 11

(Not sufficient time to enter 71-C)

LESSON PLANS - TEACHER 9

9/10/79

Introduction to fraction overhead. Discuss student book pp.

2 & 3. Use overhead.

9/11/79

Finish p. 3. Do page 4. Use overhead to draw each problem.

9/12/79

Finish 4. Do p. 5.

9/13/79

Page 6 & 7 (There doesn't seem to be an understanding of fractions).

9/14/79

Fraction game - easier form of Fraco.

9/18/79Make specific fractions using cubes forms of $1/2$, $1/3$, $2/3$, $3/4$, etc. Begin the rock booklet. Work with cm cubes each day.9/19/79

pp. 1-4 Tuesday. 5 + idea of eq. fractions.

$$\frac{2}{4} \times \frac{2}{2} = \frac{4}{8}$$

9/20/79

Fraction Game for 20 min. Do p. 5 + addition of fract.

9/21/79

Bingo for 20 min. Grade sheets on addition of fr. Story problems

p. 7.

APPENDIX E

1. Preinstructional Student Measures
2. Means and Standard Deviations for
Preinstructional Measures

INTERESTS ABOUT MATH

We would like to know how interested people are about various things in math. On the following two pages are statements like these:

I like warm sunny days.

<u>Strongly Agree</u>	<u>Agree</u>	<u>Don't Care</u>	<u>Disagree</u>	<u>Strongly Disagree</u>
-----------------------	--------------	-------------------	-----------------	--------------------------

Please check the answer that tells best how much you agree or disagree with each statement about yourself. For example, if you really like warm sunny days, you'd put a (✓) on the line above strongly agree. If you don't really care about warm sunny days, you'd put a check (✓) on the line above don't care.

There are no right or wrong answers for these exercises. They simply tell how you feel.

Ready?

BEGIN ON THE NEXT PAGE

1. Math is a waste of time.

Strongly Agree Agree Don't Care Disagree Strongly Disagree

2. Math is interesting.

Strongly Agree Agree Don't Care Disagree Strongly Disagree

3. I think math classes are too long.

Strongly Agree Agree Don't Care Disagree Strongly Disagree

4. I like anything that has to do with math.

Strongly Agree Agree Don't Care Disagree Strongly Disagree

5. I like to spend a lot of time answering math problems.

Strongly Agree Agree Don't Care Disagree Strongly Disagree

6. I like math books more than any kind of book.

Strongly Agree Agree Don't Care Disagree Strongly Disagree

7. I could do very well without math.

Strongly Agree Agree Don't Care Disagree Strongly Disagree

8. Math is a good subject.

Strongly Agree Agree Don't Care Disagree Strongly Disagree

GO ON TO THE NEXT PAGE IMMEDIATELY

9. I am not interested in math.

Strongly Agree Agree Don't Care Disagree Strongly Disagree

10. I would enjoy going to school during the summer if I could study math.

Strongly Agree Agree Don't Care Disagree Strongly Disagree

11. If it has to do with math, forget it! I hate math!

Strongly Agree Agree Don't Care Disagree Strongly Disagree

12. I would like to work where I can use math when I grow up.

Strongly Agree Agree Don't Care Disagree Strongly Disagree

13. There are lots of things I'd rather do than study math.

Strongly Agree Agree Don't Care Disagree Strongly Disagree

14. I can hardly wait for math class every day.

Strongly Agree Agree Don't Care Disagree Strongly Disagree

15. I only take math because I have to.

Strongly Agree Agree Don't Care Disagree Strongly Disagree

GO ON TO THE NEXT PAGE IMMEDIATELY

380

NAME _____

398

DIRECTIONS: The questions in this booklet are to find out how well you can solve mathematical problems. On each page of the booklet are three problems to be solved. Each problem on the page is about the same idea. You are to solve each problem and circle the letter next to the answer you think is correct. If you need to do scratch work, go ahead and use the space next to the problem. We'll try one set of problems together.

THESE PROBLEMS ARE ABOUT MOWING LAWNS

Peter, Caroline, and Leslie all mowed lawns. Peter mowed 8 lawns. Leslie mowed 4 more lawns than Peter. If Peter had mowed 2 lawns more, then he would have mowed half as many lawns as Caroline mowed.

1. Peter mowed 10 lawns.

- (A) True
- (B) False
- (C) Impossible to tell

2. How many lawns did Leslie mow?

- (A) 4
- (B) 8
- (C) 12
- (D) 14
- (E) None of these

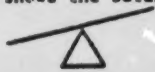
3. How many lawns did Caroline mow?

- | | |
|--------|-------------------|
| (A) 4 | (C) 16 |
| (B) 10 | (D) 20 |
| | (E) None of these |

THESE PROBLEMS ARE ABOUT BALANCE BEAMS.

4. Which picture shows the balance beam in balance?

(A)



(B)



(C)



5.



Which sentence tells about the weights **A** and **B** ?

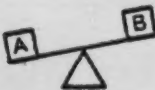
(A) **A** weighs less than **B** .

(B) **A** weighs more than **B** .

(C) **A** weighs the same as **B** .

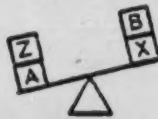
(D) Impossible to tell from the picture.

6.

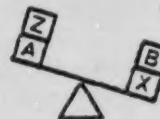


Weights **A** and **Z** are put together on one end of the balance beam and **B** and **X** are put together on the other end of the balance beam. Which picture shows how the balance beam might look?

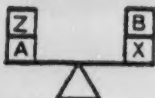
(A)



(C)

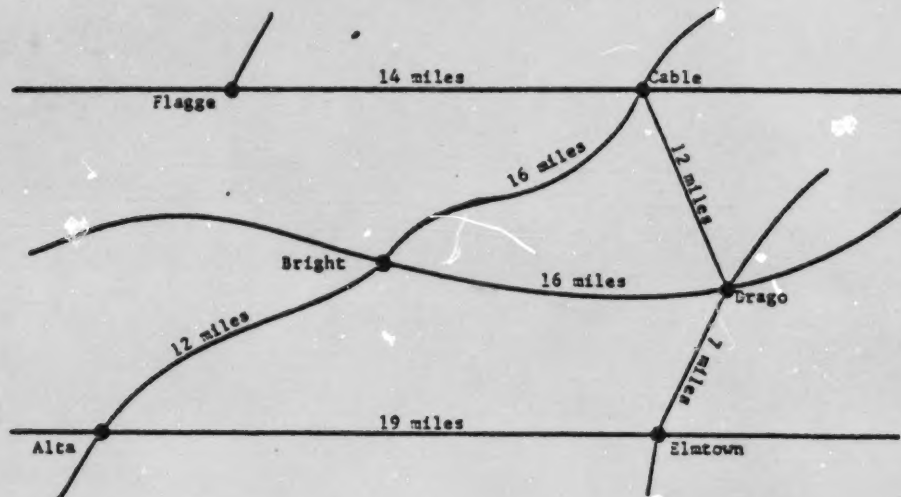


(B)



(D) Impossible to tell from the picture.

THESE PROBLEMS ARE ABOUT DISTANCES BETWEEN CITIES ON A MAP.



7. The distance from Alta to Bright is:

- (A) 7 miles
- (B) 12 miles
- (C) 16 miles
- (D) 19 miles

8. The shortest distance from Alta to Drago is:

- (A) through Bright
- (B) through Cable
- (C) through Elmtown
- (D) through Flagge

9. The sign

BRIGHT	16
ELMTOWN	19

should be placed:

- (A) in Drago
- (B) in Alta
- (C) in Flagge
- (D) in Cable
- (E) None of these

THESE PROBLEMS ARE ABOUT FISHING.

Jack and Bob went fishing. They both caught two kinds of fish, trout and pike. Bob caught 10 trout. Together they caught 18 trout and 10 pike. Jack caught 15 fish.

10. How many trout did Bob catch?

- (A) 10
 - (B) 15
 - (C) 18
 - (D) 28
 - (E) None of these
-

11. How many fish did they catch altogether?

- (A) 18
 - (B) 25
 - (C) 28
 - (D) 43
 - (E) None of these
-

12. How many pike did Bob catch?

- | | |
|-------|-------------------|
| (A) 0 | (C) 5 |
| (B) 3 | (D) 10 |
| | (E) None of these |

THESE PROBLEMS ARE ABOUT DIFFERENT COLORED HOUSES.

There are 45 houses on Century Avenue. The houses are white, blue, yellow, green, or gray. 18 of the houses are white. There are half as many blue houses as white houses. 15 of the houses are yellow. Only 1 house is gray.

13. There are more blue houses than white houses.

(A) True
(B) False
(C) Impossible to tell

14. There are more blue houses than yellow houses.

(A) True
(B) False
(C) Impossible to tell

15. How many of the houses are green?

(A) 0
(B) 1
(C) 2
(D) 5
(E) None of these

THESE PROBLEMS ARE ABOUT RELATIONSHIPS BETWEEN THINGS.

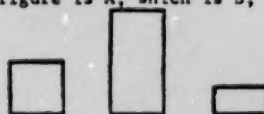
16. Which sentence tells about $A < B$?

- (A) A is less than B.
- (B) A is greater than B.
- (C) A is equal to B.

17. The sentences tell about the figures.

$$\begin{aligned} A &< B \\ B &< C \end{aligned}$$

Decide which figure is A, which is B, and which is C.



Which of the following has the correct letter written on each figure?

- (A)
- (B)
- (C)
- (D)

(E) None of these

18. The following three sentences tell about the numbers A, B, C, and D.

$$C + 3 = B$$

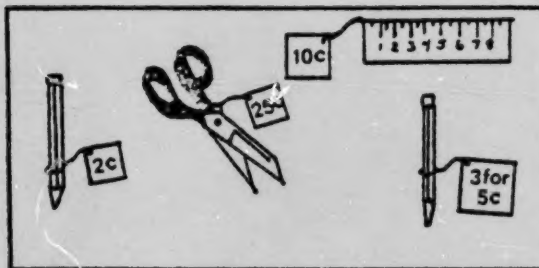
$$D < A$$

$$B = D - 4$$

Which of the following has the numbers A, B, C, D written in order from the smallest to the largest?

- (A) A, B, C, D
- (B) C, B, D, A
- (C) B, C, A, D
- (D) B, A, D, C
- (E) None of these

THESE PROBLEMS ARE ABOUT BUYING PENCILS.



19. Both pencils cost the same.

- (A) True
- (B) False
- (C) Impossible to tell

20. How much would 3 of the 2c pencils cost?

- (A) 3c
- (B) 14c
- (C) 16c
- (D) 26c
- (E) None of these

21. What is the greatest number of pencils you could buy for 27c?

- (A) 9
- (B) 13
- (C) 16
- (D) 18
- (E) None of these

THESE PROBLEMS ARE ABOUT WEIGHT LOSS.

Jack lost some weight. Susan lost half as much weight as Jack lost.

Carol lost half as much weight as Susan lost. Carol lost 10 pounds.

22. Jack lost more weight than Susan.

- (A) True
- (B) False
- (C) Impossible to tell

23. Which number tells how many pounds Susan lost?

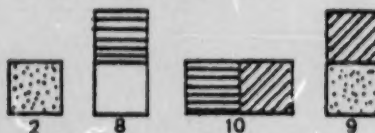
- (A) 5
- (B) 10
- (C) 20
- (D) 40
- (E) None of these

24. If Jack weighs 130 pounds now, how many pounds did he weigh before he lost weight?

- | | |
|---------|-------------------|
| (A) 140 | (C) 160 |
| (B) 150 | (D) 170 |
| | (E) None of these |

THESE PROBLEMS ARE ABOUT BLOCKS COVERING CHIPS.

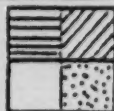
Each of the four blocks  ,  ,  ,  in the picture below is covering a number of chips. The numbers below the pictures tell how many chips are covered by these blocks.



25. How many chips are covered  ?

- (A) 2
- (B) 4
- (C) 9
- (D) 11
- (E) None of these

26. How many chips are covered



- (A) 12
- (B) 15
- (C) 17
- (D) 29
- (E) None of these

27. How many chips are covered by  ?

- (A) 0
- (B) 4
- (C) 5
- (D) 8
- (E) None of these

THESE PROBLEMS ARE ABOUT CRAYONS.

Judy has twice as many crayons as Mike. Each has more crayons than Karen. Mike has 15 crayons.

28. Karen has the most crayons.

- (A) True
 - (B) False
 - (C) Impossible to tell
-

29. How many crayons does Judy have?

- (A) 20
 - (B) 25
 - (C) 30
 - (D) 45
 - (E) None of these
-

30. Which number tells how many crayons the three could have altogether?

(You don't know exactly how many they have altogether.)

- | | |
|--------|-------------------|
| (A) 42 | (C) 63 |
| (B) 58 | (D) 72 |
| | (E) None of these |

THESE PROBLEMS ARE ABOUT A PARKING LOT.

A parking lot has room for 8 rows of cars with 9 cars parked in each of those rows.

31. When the parking lot is full, the parking lot has the same number of cars in each of the 8 rows.

(A) True
(B) False
(C) Impossible to tell

-
32. How many cars can be parked in the parking lot?

(A) 8
(B) 9
(C) 64
(D) 72
(E) None of these

-
33. In another parking lot, trucks are parked. Each truck takes the space of 3 cars. There are 12 trucks in the parking lot and it is completely full. If there were 4 rows in the parking lot, how many cars could be parked in each row?

(A) 9
(B) 12
(C) 36
(D) 48
(E) None of these

THESE PROBLEMS ARE ABOUT HOW PEOPLE WRITE NUMBERS IN CIRCLELAND.

In Circleland, people write



when they mean 475 and they

write



when they mean 61.

34. In Circleland, people write



when they mean 8.

- (A) True
- (B) False
- (C) Impossible

35. What do they mean when they write



?

- (A) 36
- (B) 63
- (C) 630
- (D) 603
- (E) 306

36. What do they mean when they write



?

- (A) 4,526
- (B) 40,526
- (C) 4,562
- (D) 43,620
- (E) 43,260

THESE PROBLEMS ARE ABOUT HOW MUCH THINGS WEIGH ON THE MOON, MARS, AND EARTH.

Everything weighs 6 times as much on Earth as it does on the Moon.

Everything weighs 2 times as much on Earth as it does on Mars.

37. A box weighs more on the Moon than it does on Earth.

- (A) True
 - (B) False
 - (C) Impossible to tell
-

38. A box weighs 24 pounds on the Moon. How much does it weigh on Earth?

- (A) 4 pounds
 - (B) 6 pounds
 - (C) 24 pounds
 - (D) 144 pounds
 - (E) None of these
-

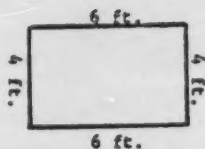
39. A dog called Rover weighs 4 pounds on the Moon. Another dog called Spot weighs 12 pounds on Mars.

If both dogs were in the same place, then

- | | |
|---------------------------------------|---|
| (A) Rover would weigh more than Spot. | (C) Rover would weigh the same as Spot. |
| (B) Rover would weigh less than Spot. | (D) Impossible to tell |

THESE PROBLEMS ARE ABOUT AREA.

This is a rectangle.



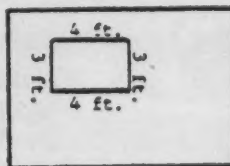
40. The rectangle is 4 feet long on one side and 6 feet long on another side.

- (A) True
- (B) False
- (C) Impossible to tell

41. The area of the rectangle is:

- (A) 10 sq. ft.
- (B) 20 sq. ft.
- (C) 24 sq. ft.
- (D) 100 sq. ft.
- (E) None of these

42. The area of the floor of a room pictured below is 96 sq. ft. A small rug is on the floor.



The area of the floor not covered by the rug is:

- | | |
|----------------|-------------------|
| (A) 79 sq. ft. | (C) 84 sq. ft. |
| (B) 82 sq. ft. | (D) 89 sq. ft. |
| | (E) None of these |

THESE PROBLEMS ARE ABOUT LIQUID MEASURE. USE THE TABLE TO HELP YOU ANSWER THE QUESTIONS.

Measurements

2 cups = 1 pint

2 pints = 1 quart

4 quarts = 1 gallon

2 half gallons = 1 gallon

43. A gallon is larger than a pint.

- (A) True
- (B) False
- (C) Impossible to tell

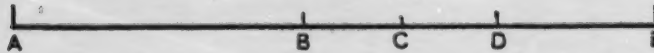
44. 16 quarts = gallons. Which number will solve the sentence?

- (A) 1
- (B) 2
- (C) 3
- (D) 4
- (E) None of these

45. 2 gallons = cups. Which number will solve the sentence?

- (A) 4
- (B) 8
- (C) 16
- (D) 32
- (E) None of these

THESE PROBLEMS ARE ABOUT MEASURING DISTANCES.



The distance from A to E is 23 cm.

The distance from D to A is 17 cm.

The distance from B to E is 14 cm.

C is half-way between B and D.

46. What is the distance from A to D?

- (A) 4 cm.
- (B) 14 cm.
- (C) 17 cm.
- (D) 23 cm.
- (E) 40 cm.

47. What is the distance from A to B?

- (A) 2 cm.
- (B) 9 cm.
- (C) 10 cm.
- (D) 12 cm.
- (E) None of these

48. What is the distance from B to C?

- | | |
|-----------|-------------------|
| (A) 4 cm. | (C) 6 cm. |
| (B) 5 cm. | (D) 10 cm. |
| | (E) None of these |

THESE PROBLEMS ARE ABOUT PASSENGERS ON A SHIP.

The dining room of a ship has 14 tables. One-half of the tables have 6 chairs at each table and the other half of the tables have 4 chairs at each table.

49. 7 tables have 6 chairs at each table.

- (A) True
- (B) False
- (C) Impossible to tell

50. What is the largest number of people that can sit in the dining room at one time?

- (A) 14
- (B) 24
- (C) 70
- (D) 140
- (E) None of these

51. Another ship has 70 passengers. If all of the passengers and crewmen are sitting in the lifeboats, there are 7 passengers and 2 crewmen in each lifeboat. How many crewmen are on the ship?

- (A) 2
- (B) 14
- (C) 20
- (D) 70
- (E) None of these

THESE PROBLEMS ARE ABOUT NUMBER PATTERNS.

Which number belongs in the to complete the number pattern.

52. 1 2 3 5 6

(A) 3

(B) 4

(C) 5

(D) 8

53. 4 7 10 16 19

(A) 9

(B) 10

(C) 13

(D) 15

(E) None of these

54. 1 2 4 7 16 22

(A) 9

(C) 11

(B) 10

(D) 13

(E) None of these

THESE PROBLEMS ARE ABOUT PENCILS AND CANDY.

Rosemarie had 30 pencils. She lost 16 of them.

55. She has fewer pencils now.

- (A) True
 - (B) False
 - (C) Impossible to tell
-

56. How many pencils does she have now?

- (A) 14
 - (B) 16
 - (C) 24
 - (D) 26
 - (E) None of these
-

57. Kirk had some pieces of candy. He gave one-half of them to Mary. Then he gave 3 pieces to Harold and had 6 pieces left. How many pieces did he start with?

- | | |
|--------|-------------------|
| (A) 9 | (C) 15 |
| (B) 10 | (D) 18 |
| | (E) None of these |

THESE PROBLEMS ARE ABOUT MEASURING DISTANCES BETWEEN CITIES.

n is the number of miles from Chicago to Detroit.



58. Which is the true sentence?

- (A) It takes n hours to drive from Chicago to Detroit.
- (B) n is the number of miles from Detroit to Chicago.
- (C) It takes n hours to fly from Chicago to Detroit.
- (D) n is the distance in miles from Detroit to Cleveland.

59. $2(n) + 100$ represents:

- (A) The distance from Chicago to Cleveland.
- (B) A distance twice the distance from Chicago to Detroit.
- (C) A distance less than the distance between Chicago and Detroit.
- (D) A distance more than twice the distance between Chicago and Detroit.
- (E) None of these



60. The distance from A to C is twice the distance from C to B. If you drive from A to B and then back to C, you will have gone:

- | | |
|---------------------------------------|--|
| (A) 4 times the distance from A to C. | (C) $1\frac{1}{2}$ times the distance from A to C. |
| (B) 2 times the distance from A to C. | (D) $1\frac{1}{4}$ times the distance from A to C. |
| | (E) None of these |

THESE PROBLEMS ARE ABOUT A CUBE.

This is a picture of a cube.



61. Which picture has a ● on a face of the cube?

(A)



(B)



(C)



62. How many faces does a cube have altogether?

(A) 3

(B) 4

(C) 5

(D) 6

(E) None of these

63. These are four views of the same cube.



Here is another view of the same cube.



Which figure goes on the  ?

(A) *

(C) ⌘

(B) ◇

(D) ◇

(E) ●

THESE PROBLEMS ARE ABOUT A FERRYBOAT CROSSING A RIVER.

A ferryboat never crosses the river unless it is full. The ferryboat is full when it holds 12 cars. The ferry is also full when it holds 8 trucks. Cars and trucks are never on the ferryboat at the same time.

64. Sometimes the ferryboat crosses the river with 10 cars.

- (A) True
 - (B) False
 - (C) Impossible to tell
-

65. In two trips, how many trucks could the ferryboat have carried?

- (A) 8
 - (B) 12
 - (C) 16
 - (D) 24
 - (E) None of these
-

66. The ferryboat made 4 trips across the river and carried 44 vehicles.

(Cars and trucks are vehicles) Which of the following sentences could be true?

- | | |
|---|--|
| (A) The ferryboat was filled with cars each time. | (C) The ferryboat was filled with cars more than one-half the time. |
| (B) The ferryboat was filled with trucks each time. | (D) The ferryboat was filled with trucks at least one-half the time. |
| | (E) None of these |

THESE PROBLEMS ARE ABOUT FINDING SUMS OF NUMBERS.

67. What is the answer to $\begin{array}{r} 6 \\ + 9 \\ \hline \end{array}$?

- (A) 14
- (B) 15
- (C) 16
- (D) 17

68. What is the answer to $\begin{array}{r} 463 \\ + 296 \\ \hline \end{array}$?

- (A) 659
- (B) 669
- (C) 759
- (D) 769
- (E) None of these

69. Which number belongs in the ?

$$\begin{array}{r} 3\square 5 \\ + 25\bigcirc \\ \hline \triangle 43 \end{array}$$

- (A) 0
- (B) 1
- (C) 8
- (D) 9
- (E) None of these

404

TEST NO. _____

WAUSAU DISTRICT PUBLIC SCHOOLS
MATHEMATICS COMPETENCY EXAM
GRADE 4

422

SAMPLE PROBLEM

$$\begin{array}{r}
 1. \quad 64 \\
 + 21 \\
 \hline
 \end{array}$$

- A. 75
- B. 95
- C. 85
- D. 90

CHOICE C IS THE CORRECT ANSWER. ON THE ANSWER SHEET YOU WOULD MARK IN C. KEEP PENCIL MARKS BETWEEN THE BRACKETS.

1 0 0 0 0 0 2 0 0 0 0 0 3 0 0 0 0 0

DO YOUR WORK ON SCRATCH PAPER. NO WRITING IN THE TEST BOOKLET.

1.
$$\begin{array}{r} 7,005 \\ + 1,683 \\ \hline \end{array}$$

- A. 7,688
- B. 8,008
- C. 8,688
- D. 8,689

2.
$$\begin{array}{r} 3,264 \\ + 4,635 \\ \hline \end{array}$$

- A. 7,898
- B. 7,899
- C. 7,909
- D. 7,999

3.
$$\begin{array}{r} 85 \\ + 414 \\ \hline \end{array}$$

- A. 471
- B. 489
- C. 496
- D. 499

4.
$$\begin{array}{r} 5 \\ 9 \\ + 6 \\ \hline \end{array}$$

- A. 19
- B. 20
- C. 21
- D. 22

5.
$$\begin{array}{r} 58 \\ 42 \\ + 29 \\ \hline \end{array}$$

- A. 115
- B. 119
- C. 125
- D. 129

6.
$$\begin{array}{r} 6502 \\ + 609 \\ \hline \end{array}$$

- A. 6,111
- B. 7,111
- C. 7,129
- D. 12,511

7.
$$\begin{array}{r} 945 \\ + 876 \\ \hline \end{array}$$

- A. 1,711
- B. 1,721
- C. 1,811
- D. 1,821

8.
$$\begin{array}{r} 89 \\ - 5 \\ \hline \end{array}$$

- A. 84
- B. 83
- C. 74
- D. 39

9.
$$\begin{array}{r} 793 \\ - 52 \\ \hline \end{array}$$

- A. 273
- B. 291
- C. 741
- D. 771

10.
$$\begin{array}{r} 892 \\ - 401 \\ \hline \end{array}$$

- A. 401
- B. 491
- C. 591
- D. 1,293

11.
$$\begin{array}{r} 55 \\ - 29 \\ \hline \end{array}$$

- A. 26
- B. 27
- C. 34
- D. 36

12.
$$\begin{array}{r} 642 \\ - 93 \\ \hline \end{array}$$

- A. 735
- B. 549
- C. 548
- D. 449

13.
$$\begin{array}{r} 908 \\ - 19 \\ \hline \end{array}$$

- A. 887
- B. 889
- C. 911
- D. 984

14. $8 \times 5 = \square$

- A. 30
- B. 40
- C. 45
- D. 50

15. $9 \times \square = 54$

- A. 8
- B. 9
- C. 7
- D. 6

16.
$$\begin{array}{r} 7 \\ \times 8 \\ \hline \end{array}$$

- A. 42
- B. 48
- C. 56
- D. 64

17.
$$\begin{array}{r} 23 \\ \times 2 \\ \hline \end{array}$$

- A. 25
- B. 21
- C. 56
- D. 46

18.
$$\begin{array}{r} 706 \\ \times 8 \\ \hline \end{array}$$

- A. 714
- B. 608
- C. 5,648
- D. 5,448

19.
$$\begin{array}{r} 357 \\ \times 6 \\ \hline \end{array}$$

- A. 2,142
- B. 2,102
- C. 183,042
- D. 1,842

20.
$$\begin{array}{r} 83 \\ \times 15 \\ \hline \end{array}$$

- A. 498
- B. 1,245
- C. 1,295
- D. 4,845

21.
$$\begin{array}{r} 58 \\ \times 37 \\ \hline \end{array}$$

- A. 580
- B. 1,146
- C. 2,046
- D. 2,146

22. $7 \overline{)49}$

- A. 6
- B. 7
- C. 8
- E. 9

23. $8 \overline{)72}$

- A. 9
- B. 8
- C. 7
- D. 6

24. $5 \div 5 = \square$

- A. 0
- B. 1
- C. 10
- D. 15

25. $4 \overline{)84}$

- A. 12
- B. 20
- C. 21
- D. 41

26. $5 \overline{)65}$

- A. 11
- B. 13
- C. 15
- D. 103

27. $2 \overline{)56}$

- A. 18
- B. 23
- C. 28
- D. 32

28. FOUR THOUSAND FIVE HUNDRED EIGHTY SEVEN IS THE SAME AS?

- A. 45,087
- B. 4,587
- C. 4,057
- D. 48,570

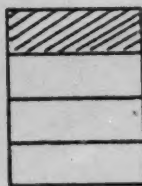
29. THE NUMBER 9,052 IS READ AS?

- A. NINE THOUSAND FIFTY TWO
- B. NINE HUNDRED FIFTY TWO
- C. NINETY FIVE THOUSAND TWO
- D. NINETY THOUSAND FIFTY TWO

30. SEVEN HUNDRED NINE IS THE SAME AS?

- A. 7,009
- B. 790
- C. 709
- D. 71,009

31. THE SHADED PART OF THE RECTANGLE IS REPRESENTED BY WHICH FRACTION?



- A. $\frac{2}{3}$
 B. $\frac{1}{3}$
 C. $\frac{1}{4}$
 D. $\frac{3}{4}$

32. WHICH FRACTION REPRESENTS THE SHADED CIRCLES IN THE SET?



- A. $\frac{2}{3}$
 B. $\frac{1}{3}$
 C. $\frac{1}{2}$
 D. $\frac{2}{2}$

33. WHICH FIGURE HAS $\frac{1}{2}$ THE AREA SHADED?



34. $\frac{3}{3}$ HAS THE SAME VALUE AS WHICH NUMERAL?

- A. 0
- B. 3
- C. 9
- D. 1

35. THE NUMBER 1 HAS THE SAME VALUE AS WHICH FRACTION?

- A. $\frac{0}{1}$
- B. $\frac{3}{4}$
- C. $\frac{4}{4}$
- D. $\frac{1}{4}$

36. WHICH FRACTION IS THE GREATEST?

- A. $\frac{5}{7}$
- B. $\frac{4}{7}$
- C. $\frac{3}{7}$
- D. $\frac{2}{7}$

37. WHICH FRACTION IS THE LEAST?

- A. $\frac{5}{7}$
- B. $\frac{4}{7}$
- C. $\frac{3}{7}$
- D. $\frac{2}{7}$

38. MARY HAD $\frac{1}{2}$ OF AN APPLE, JOHN HAD $\frac{1}{4}$ OF AN APPLE,
AND RUTH HAD $\frac{1}{3}$ OF AN APPLE.

WHO HAD THE LARGEST PIECE OF APPLE?

- A. MARY
- B. JOHN
- C. RUTH
- D. ALL HAD THE SAME AMOUNT

39. $\frac{2}{5} + \frac{1}{5} = \square$

- A. $\frac{3}{5}$
- B. $\frac{3}{10}$
- C. $\frac{3}{25}$
- D. $\frac{2}{10}$

40. $\frac{3}{8} + \frac{3}{8} = \square$

- A. $\frac{9}{64}$
- B. $\frac{6}{16}$
- C. $\frac{6}{8}$
- D. $\frac{9}{16}$

41. $\frac{4}{7} - \frac{2}{7} = \square$

- A. $\frac{6}{14}$
- B. $\frac{2}{0}$
- C. $\frac{2}{14}$
- D. $\frac{2}{7}$

STOP

PUT DOWN YOUR PENCILS -- CLOSE YOUR TEST BOOKLET
REST!!

-15-

42. 100 CENTIMETERS IS THE SAME AS?

- A. 1 METER
- B. 10 METERS
- C. 100 METERS
- D. 1000 METERS

43. If 1 FOOT = 12 INCHES, THEN 4 FEET =

- A. 36 INCHES
- B. 24 INCHES
- C. 48 INCHES
- D. 60 INCHES

44. If 1 GALLON = 4 QUARTS, THEN 2 GALLONS =

- A. 8 QUARTS
- B. 4 QUARTS
- C. 1 QUART
- D. 6 QUARTS

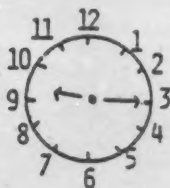
45. 1 HOURS IS THE SAME AS?

- A. 45 MINUTES
- B. 100 MINUTES
- C. 60 MINUTES
- D. 30 MINUTES

46. JOHN IS 4 FEET 2 INCHES TALL, MARY IS 43 INCHES, AND SALLY IS 4 FEET. WHICH PERSON IS THE SHORTEST?

- A. JOHN
- B. MARY
- C. SALLY
- D. ALL ARE THE SAME HEIGHT

47. WHICH TIME IS SHOWN ON THE CLOCK?



- A. 3:15
- B. 9:00
- C. 9:15
- D. 2:45

48. WHAT IS THE MOST EXACT LENGTH OF THIS LINE SEGMENT?



- A. 3 INCHES
- B. $3\frac{1}{4}$ INCHES
- C. 4 INCHES
- D. $3\frac{1}{2}$ INCHES

49. WHAT IS THE MOST EXACT LENGTH OF THIS LINE SEGMENT?



- A. 6 CENTIMETERS
- B. 4 CENTIMETERS
- C. 5 CENTIMETERS
- D. 7 CENTIMETERS

50. 379 ROUNDED TO THE NEAREST HUNDRED IS?

- A. 300
- B. 370
- C. 380
- D. 400

51. WHICH NUMBER CAN BE ROUNDED TO 20?

- A. 35
- B. 77
- C. 72
- D. 90

52. BY ROUNDING EACH NUMBER TO THE NEAREST 10'S PLACE BEFORE YOU ADD, ESTIMATE THE ANSWER.

$$\begin{array}{r} 64 \\ + 29 \\ \hline \end{array}$$

- A. 90
- B. 80
- C. 100
- D. 95

53. WHICH OF THE PROBLEMS WOULD BEST BE ESTIMATED 400 BY FIRST ROUNDING EACH ADDEND TO THE NEAREST 100?

- A. $\begin{array}{r} 323 \\ + 92 \\ \hline \end{array}$
- B. $\begin{array}{r} 265 \\ + 289 \\ \hline \end{array}$
- C. $\begin{array}{r} 214 \\ + 51 \\ \hline \end{array}$
- D. $\begin{array}{r} 493 \\ + 87 \\ \hline \end{array}$

54. WHICH UNIT IS MOST OFTEN USED TO TELL HOW MUCH AN AUTO GAS TANK WILL HOLD?

- A. CUPS
- B. PINTS
- C. QUARTS
- D. GALLONS

55. WHICH UNIT IS USED WHEN WEIGHING YOURSELF?

- A. OUNCES
- B. POUNDS
- C. TONS
- D. FEET

56. WHICH UNIT IS USED TO MEASURE THE DISTANCE FROM WAUSAU TO STEVENS POINT?

- A. CENTIMETERS
- B. LITERS
- C. KILOMETERS
- D. GRAMS

57. HOW MANY QUARTERS EQUAL ONE DOLLAR?

- A. 6
- B. 8
- C. 2
- D. 4

58. HOW MUCH MONEY IS SHOWN?



- A. \$1.02
- B. \$1.05
- C. \$1.27
- D. \$1.97

59. WHICH PICTURE SHOWS 98¢

A.



B.



C.



D.



60. HOW MANY NICKELS EQUAL \$1.00?

- A. 5 NICKELS
- B. 10 NICKELS
- C. 15 NICKELS
- D. 20 NICKELS

61. \$3.72 IS THE SAME AS?

- A. 372¢
- B. \$372
- C. \$3.72¢
- D. \$37.20

62. 52¢ IS THE SAME AS?

- A. \$52
- B. \$.52
- C. .52¢
- D. \$52¢

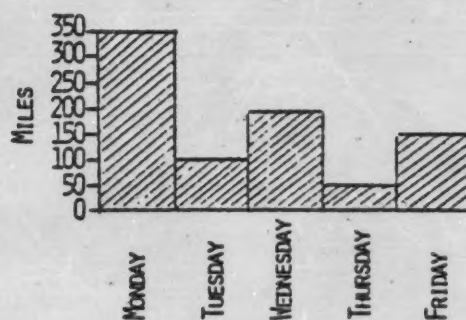
63. \$4.33 IS THE SAME AS?

- A. FOUR HUNDRED AND THIRTY THREE DOLLARS
- B. FOUR DOLLARS AND THIRTY THREE CENTS
- C. FORTY DOLLARS AND THREE CENTS
- D. FOUR DOLLARS AND THREE CENTS

64. ONE HUNDRED THREE DOLLARS AND FIVE CENTS IS THE SAME AS?

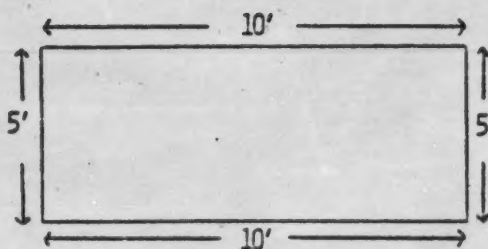
- A. \$ 13.50
- B. \$103.50
- C. \$135.00
- D. \$103.05

65. ON WHAT DAY DID THE SMITH'S TRAVEL 100 MILES?



- A. TUESDAY
- B. WEDNESDAY
- C. THURSDAY
- D. FRIDAY

- 66.



HOW MUCH FENCE IS NEEDED FOR FIDO'S PEN?

- A. 15 FEET
- B. 20 FEET
- C. 25 FEET
- D. 30 FEET

67.

CITY	HIGH TEMP.	LOW TEMP.	RAINFALL INCHES
NEW YORK	67	52	1
CHICAGO	83	65	0
ATLANTA	81	74	$\frac{1}{2}$
SAN FRANCISCO	65	61	$\frac{1}{3}$

LOOK AT THE TABLE ABOVE. WHICH CITY HAD THE HIGHEST TEMPERATURE?

- A. NEW YORK
- B. CHICAGO
- C. ATLANTA
- D. SAN FRANCISCO

68. IT COST \$34,900 TO BUILD A HOUSE. THE LAND COST \$8,500. WHAT DID THE HOUSE AND LAND COST TOGETHER?

- A. \$26,400
- B. \$35,400
- C. \$42,900
- D. \$43,400

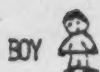
69. JAN SAVES \$2.00 EACH MONTH. HOW MUCH CAN SHE SAVE IN 12 MONTHS?

A. \$ 2.00
B. \$ 6.00
C. \$14.00
D. \$24.00

70. A SHIRT COSTS \$4.00 AND IS PAID FOR WITH A \$10.00 BILL. WHAT IS THE CORRECT CHANGE?

A. \$ 4.00
B. \$ 6.00
C. \$10.00
D. \$14.00

- 71.



85 LBS.



62 LBS.



47 LBS.

HOW MUCH DO THEY WEIGH ALTOGETHER?

A. 204 POUNDS
B. 194 POUNDS
C. 158 POUNDS
D. 147 POUNDS

72. IF YOU TRAVEL FOR 6 HOURS AT 55 MILES PER HOUR,
HOW FAR CAN YOU GO?

A. 300 MILES
B. 275 MILES
C. 330 MILES
D. 385 MILES

73. IF YOU WATCHED TWO TV PROGRAMS THAT ARE EACH
30 MINUTES LONG, HOW LONG DID YOU WATCH TV?

A. $\frac{1}{2}$ HOUR
B. 1 HOUR
C. $1\frac{1}{2}$ HOURS
D. 2 HOURS

74. TUESDAY HILDA AND CRAIG WASHED DISHES FOR 15 MINUTES
AFTER BREAKFAST, 35 MINUTES AFTER LUNCH AND 1 HOUR
AFTER SUPPER. HOW LONG DID THEY WASH DISHES THAT DAY?

A. 50 MINUTES
B. 1 HOUR 35 MINUTES
C. 1 HOUR 50 MINUTES
D. 2 HOURS 30 MINUTES

75. THE SNOW MOUNTAIN SKI RUN IS 1,247 FEET LONG.
THE CANNON BALL SKI RUN IS 946 FEET LONG.
HOW MUCH LONGER IS THE SNOW MOUNTAIN RUN?
- A. 301 FEET
 - B. 311 FEET
 - C. 393 FEET
 - D. 1,201 FEET
76. IT TAKES 3 HOURS TO DRIVE TO AUNT MARY'S HOUSE.
IF YOU LEAVE AT 7:00 A.M., WHAT TIME WILL YOU
GET THERE?
- A. 4:00 A.M.
 - B. 7:00 A.M.
 - C. 10:00 A.M.
 - D. 12:00 A.M.

Table A
Means and Standard Deviations for Preinstructional Measures
by Class (All Students and Observed Students)

Class	Measure					
	Attitude		Problem Solving		Competency	
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
1						
All	55.78	9.92	29.79	7.71	62.58	10.83
Observed	54.13	9.31	28.38	9.87	60.38	15.01
2						
All	55.53	7.99	44.82	6.93	70.94	3.57
Observed	55.13	10.30	43.13	11.58	70.63	5.15
3						
All	46.46	6.35	28.14	11.84	63.79	7.12
Observed	47.00	8.42	30.38	15.97	63.25	9.94
4						
All	49.69	8.56	33.07	9.34	65.46	8.29
Observed	47.50	10.81	31.13	12.59	63.75	11.22
5						
All	48.10	6.02	33.10	10.68	64.06	8.15
Observed	51.25	6.94	35.75	14.00	62.75	11.23

Table A (continued)

Class	Measure					
	Attitude		Problem Solving		Competency	
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
6						
All	51.62	9.10	37.31	7.62	63.85	10.48
Observed	48.29	10.78	38.25	11.50	62.75	10.79
7						
All	55.00	11.56	23.81	9.25	62.25	8.84
Observed	51.38	13.63	28.00	12.81	59.25	11.51
8						
All	48.35	9.94	35.35	7.54	63.44	7.80
Observed	48.25	12.10	33.75	9.71	64.38	10.45
9						
All	49.93	10.52	21.14	7.15	52.43	7.81
Observed	49.93	10.52	21.14	7.15	52.43	7.81

APPENDIX F

1. Student Outcome Measures
2. Means and Standard Deviations
for Student Outcome Measures

INTERESTS ABOUT MATH

We would like to know how interested people are about various things in math. On the following two pages are statements like these:

I like warm sunny days.

<u>Strongly Agree</u>	<u>Agree</u>	<u>Don't Care</u>	<u>Disagree</u>	<u>Strongly Disagree</u>
-----------------------	--------------	-------------------	-----------------	--------------------------

Please check the answer that tells best how much you agree or disagree with each statement about yourself. For example, if you really like warm sunny days, you'd put a (✓) on the line above strongly agree. If you don't really care about warm sunny days, you'd put a check (✓) on the line above don't care.

There are no right or wrong answers for these exercises. They simply tell how you feel.

Ready?

BEGIN ON THE NEXT PAGE

1. Math is a waste of time.

Strongly Agree Agree Don't Care Disagree Strongly Disagree

2. Math is interesting.

Strongly Agree Agree Don't Care Disagree Strongly Disagree

3. I think math classes are too long.

Strongly Agree Agree Don't Care Disagree Strongly Disagree

4. I like anything that has to do with math.

Strongly Agree Agree Don't Care Disagree Strongly Disagree

5. I like to spend a lot of time answering math problems.

Strongly Agree Agree Don't Care Disagree Strongly Disagree

6. I like math books more than any kind of book.

Strongly Agree Agree Don't Care Disagree Strongly Disagree

7. I could do very well without math.

Strongly Agree Agree Don't Care Disagree Strongly Disagree

8. Math is a good subject.

Strongly Agree Agree Don't Care Disagree Strongly Disagree

GO ON TO THE NEXT PAGE IMMEDIATELY

9. I am not interested in math.

Strongly Agree Agree Don't Care Disagree Strongly Disagree

10. I would enjoy going to school during the summer if I could study math.

Strongly Agree Agree Don't Care Disagree Strongly Disagree

11. If it has to do with math, forget it! I hate math!

Strongly Agree Agree Don't Care Disagree Strongly Disagree

12. I would like to work where I can use math when I grow up.

Strongly Agree Agree Don't Care Disagree Strongly Disagree

13. There are lots of things I'd rather do than study math.

Strongly Agree Agree Don't Care Disagree Strongly Disagree

14. I can hardly wait for math class every day.

Strongly Agree Agree Don't Care Disagree Strongly Disagree

15. I only take math because I have to.

Strongly Agree Agree Don't Care Disagree Strongly Disagree

GO ON TO THE NEXT PAGE IMMEDIATELY

WHAT DO YOU THINK

We also want to know how you feel about the way your math teacher taught you the past two weeks. On the following three pages are statements like these:

I like to go swimming:

<u>Never</u>	<u>Seldom</u>	<u>Sometimes</u>	<u>Often</u>	<u>Always</u>
--------------	---------------	------------------	--------------	---------------

Please check the answer which best describes how often each statement is true about yourself. For example, if you never like to go swimming, you would put a check (✓) on the line above never. If you like to go swimming about half the time you would put a check (✓) on the line above sometimes.

There are no right or wrong answers for these exercises. They simply tell how you feel.

Ready?

BEGIN ON THE NEXT PAGE

1. The teacher tried to answer all our questions.

Never Seldom Sometimes Often Always

2. I had trouble understanding things because the teacher went too fast.

Never Seldom Sometimes Often Always

3. The teacher told us when we should remember something.

Never Seldom Sometimes Often Always

4. I didn't understand when the teacher explained things.

Never Seldom Sometimes Often Always

5. When the teacher used examples, it really helped me understand.

Never Seldom Sometimes Often Always

6. The teacher didn't explain to us why we needed to learn this topic.

Never Seldom Sometimes Often Always

7. When the teacher asked questions, it helped me think about what I was doing.

Never Seldom Sometimes Often Always

8. The teacher didn't tell us exactly what to do and how to do it.

Never Seldom Sometimes Often Always

GO ON TO THE NEXT PAGE IMMEDIATELY

9. The teacher told us how what we were doing would help us later.

Never Seldom Sometimes Often Always

10. We didn't know what we were going to do tomorrow.

Never Seldom Sometimes Often Always

11. The topic was just right for us. Not too hard or not too easy.

Never Seldom Sometimes Often Always

12. The teacher didn't answer our questions.

Never Seldom Sometimes Often Always

13. The teacher asked us if we knew what to do.

Never Seldom Sometimes Often Always

14. The teacher didn't repeat things that were hard to understand.

Never Seldom Sometimes Often Always

15. When the teacher worked problems on the blackboard, it helped me understand them better.

Never Seldom Sometimes Often Always

16. I could not understand why we were doing what we were doing.

Never Seldom Sometimes Often Always

GO ON TO THE NEXT PAGE IMMEDIATELY

17. At the end of math class the teacher talked about what we had done that day.

<u>Never</u>	<u>Seldom</u>	<u>Sometimes</u>	<u>Often</u>	<u>Always</u>
--------------	---------------	------------------	--------------	---------------

18. I got confused when the teacher asked a lot of questions.

<u>Never</u>	<u>Seldom</u>	<u>Sometimes</u>	<u>Often</u>	<u>Always</u>
--------------	---------------	------------------	--------------	---------------

19. The teacher explained things slowly enough so that I could understand them.

<u>Never</u>	<u>Seldom</u>	<u>Sometimes</u>	<u>Often</u>	<u>Always</u>
--------------	---------------	------------------	--------------	---------------

20. The teacher didn't give us examples I could understand.

<u>Never</u>	<u>Seldom</u>	<u>Sometimes</u>	<u>Often</u>	<u>Always</u>
--------------	---------------	------------------	--------------	---------------

21. The teacher explained what we were going to do next.

<u>Never</u>	<u>Seldom</u>	<u>Sometimes</u>	<u>Often</u>	<u>Always</u>
--------------	---------------	------------------	--------------	---------------

22. We did not get enough time to practice our work.

<u>Never</u>	<u>Seldom</u>	<u>Sometimes</u>	<u>Often</u>	<u>Always</u>
--------------	---------------	------------------	--------------	---------------

23. The teacher kept telling us to ask questions if we did not understand.

<u>Never</u>	<u>Seldom</u>	<u>Sometimes</u>	<u>Often</u>	<u>Always</u>
--------------	---------------	------------------	--------------	---------------

24. The teacher didn't tell us what things we should remember.

<u>Never</u>	<u>Seldom</u>	<u>Sometimes</u>	<u>Often</u>	<u>Always</u>
--------------	---------------	------------------	--------------	---------------

GO ON TO THE NEXT PAGE IMMEDIATELY

25. When we started something new, the teacher helped us understand why it is important.

Never Seldom Sometimes Often Always

26. I felt that the teacher started new things before I was ready.

Never Seldom Sometimes Often Always

27. I knew what the teacher wanted me to learn.

Never Seldom Sometimes Often Always

28. I didn't understand how what we were doing depended on what we had done before.

Never Seldom Sometimes Often Always

29. The teacher used words I could understand.

Never Seldom Sometimes Often Always

30. The teacher did not give us enough time to think about what we are doing.

Never Seldom Sometimes Often Always

31. The teacher repeated things that were important for us to remember.

Never Seldom Sometimes Often Always

32. It was hard for me to know what I was supposed to be doing.

Never Seldom Sometimes Often Always

Achievement Test on Fractions

Name _____

Find the equivalent fraction or mixed number.

$$1. \frac{1}{3} = \frac{\boxed{}}{9}$$

$$6. \frac{6}{10} = \frac{\boxed{}}{5}$$

$$2. \frac{9}{12} = \frac{\boxed{}}{4}$$

$$7. \frac{11}{3} = \boxed{} \frac{\boxed{}}{3}$$

$$3. \frac{1}{2} = \frac{\boxed{}}{14}$$

$$8. 3 \frac{2}{5} = \frac{\boxed{}}{5}$$

$$4. \frac{3}{4} = \frac{\boxed{}}{8}$$

$$9. \frac{29}{9} = \boxed{} \frac{\boxed{}}{9}$$

$$5. \frac{9}{15} = \frac{\boxed{}}{5}$$

$$10. 5 \frac{6}{11} = \frac{\boxed{}}{11}$$

Put >, <, or = in each box to make the sentence true.

$$11. \frac{3}{8} \boxed{} \frac{1}{4}$$

$$12. 2 \frac{8}{12} \boxed{} 2 \frac{2}{3}$$

$$13. \frac{1}{2} \boxed{} \frac{6}{12}$$

$$14. \frac{11}{24} \boxed{} \frac{5}{6}$$

$$15. 2 \frac{4}{7} \boxed{} 1 \frac{13}{28}$$

Write a sentence that tells about each story. You do not have to solve your sentence.

16. Larry painted $\frac{1}{4}$ of a house in the morning. Mark painted in the afternoon. If $\frac{5}{6}$ of the house was painted that day, how much of the house did Mark paint in the afternoon?
17. Mrs. Domingues bought some ribbon. She used $2\frac{5}{8}$ meters to trim a dress. If she has $3\frac{1}{4}$ meters of ribbon left, how many meters of ribbon did she buy?
18. Kirk picked $\frac{1}{3}$ pail of raspberries. Joanne picked $2\frac{1}{2}$ pails of raspberries. How many pails did they pick altogether?
19. Ivan had $\frac{2}{3}$ can of green paint. He used some of it to paint a birdhouse. Now he has $\frac{1}{2}$ can of green paint. How much paint did he use to paint the birdhouse?
20. Dawn drank some milk in the morning. At night she drank $\frac{1}{2}$ glass of milk. If she drank $1\frac{1}{4}$ glasses of milk altogether, how many glasses of milk did she drink in the morning?

Solve the sentence.

21. $\frac{2}{5} + \frac{3}{10} = \square$

26. $\square + \frac{2}{7} = \frac{11}{14}$

22. $\frac{7}{8} - \frac{5}{8} = \square$

27. $\frac{9}{12} - \square = \frac{2}{3}$

23. $\frac{5}{6} - \square = \frac{2}{3}$

28. $\frac{1}{5} + \frac{2}{3} = \square$

24. $\square - \frac{1}{2} = \frac{1}{5}$

29. $\frac{7}{8} - \frac{1}{3} = \square$

25. $\frac{7}{8} + \square = \frac{17}{16}$

30. $\square - \frac{5}{12} = \frac{1}{4}$

In this part you will have two things to do:

- a) Write a sentence that tells about each story.
- b) Solve your sentence.

- 31. Sam bought $\frac{3}{4}$ bushel of potatoes at the supermarket. He gave $\frac{2}{3}$ of a bushel to Phil. How much did Sam have left?
- 32. Susan has $\frac{3}{8}$ pound of nails. Tom has $\frac{1}{3}$ pound of nails. Who has more nails? How much more?
- 33. If Terry has $\frac{1}{3}$ of a bucket of paint and Bill has $\frac{1}{4}$ of a bucket, can they paint a dog house that needs $\frac{1}{2}$ bucket of paint?
- 34. Judy ran $\frac{3}{8}$ of a mile in the morning and $\frac{1}{8}$ of a mile in the afternoon. How much did she run altogether?
- 35. Jerry runs $\frac{2}{3}$ of a mile in the morning and $\frac{1}{4}$ of a mile in the afternoon. How far will Jerry run in 4 days?

Table A
Means and Standard Deviations for Postinstructional Measures
by Class (All Students and Observed Students)

Class	Measure							
	Attitude		Perceived clarity (all items)		Perceived clarity (16 items)		Postachievement	
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
1								
All	53.77	11.21	112.10	18.30	55.90	8.21	16.56	10.58
Observed	47.75	11.91	101.27	24.01	52.52	10.84	14.63	12.77
2								
All	53.98	8.79	121.94	11.45	58.67	6.61	29.09	7.38
Observed	51.88	10.32	122.98	14.98	58.86	8.43	29.38	8.98
3								
All	46.68	6.59	117.47	15.07	57.65	8.55	21.73	7.77
Observed	47.25	8.83	124.75	16.98	61.75	8.68	21.75	11.83

Table A (continued)

Class	Measure							
	Attitude		Perceived clarity (all items)		Perceived clarity (16 items)		Postachievement	
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
4								
All	46.41	10.25	116.85	15.84	59.10	8.02	14.86	5.70
Observed	42.88	10.49	113.00	21.31	57.62	12.03	13.63	6.32
5								
All	46.90	6.28	116.78	9.49	56.85	5.00	20.45	10.80
Observed	48.25	7.70	115.71	7.85	55.75	4.13	22.88	12.08
6								
All	50.65	9.89	119.19	10.19	57.36	5.18	23.27	7.36
Observed	47.00	12.74	120.84	13.21	58.00	6.39	22.50	9.13

Table A (continued)

Class	Measure							
	Attitude		Perceived clarity (all items)		Perceived clarity (16 items)		Postachievement	
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
7								
A11	55.14	11.75	123.05	15.69	61.00	7.31	22.38	8.97
Observed	49.75	12.51	113.51	15.09	55.25	6.36	23.50	9.68
8								
A11	50.94	10.05	111.84	8.01	56.48	4.89	7.82	3.73
Observed	51.75	10.40	114.77	5.97	57.40	3.86	8.00	4.99
9								
A11	52.71	17.17	110.31	5.98	53.29	1.50	6.57	5.77
Observed	52.71	17.17	110.31	5.98	53.29	1.50	6.57	5.77

APPENDIX G

1. Instructional Materials: Teacher Guide,
Student Guide, Student Booklet
2. Motivation Information

MOTIVATION STRATEGY INFORMATION

TEACHER PLANNING STUDY

1979

TABLE OF CONTENTS

	Page
I. Introduction	1
II. Procedures for Using Motivational Strategies	4

Use of Motivational Strategies in the Classroom

The motivational strategies which are presented here are of three types: (1) grouping for cooperation, (2) the effective use of competition and (3) the effective use of games in the classroom. Each of these strategies was chosen primarily because of the ease with which it might be implemented in the classroom. In addition, the use of games is an integral part of the DMP (Developing Mathematical Processes) curriculum.

It should be said right away that the random use of any of the motivational strategies to be described in no way guarantees its effectiveness in either increasing student motivation or student achievement. However, when used in the right situations, all strategies have been shown to be effective in increasing student motivation as well as student achievement. The purpose of this document is to explain just how, and with what students, these three motivational strategies might be used with greatest effectiveness. Each strategy will be briefly introduced, and then, in Section II the conditions under which each should be used will be discussed more fully.

Motivation Through Cooperation

There is considerable evidence to suggest that when students cooperate with other students in a classroom setting, to accomplish some school task which has been given them, student motivation to

complete the task is greater than if student-student cooperation was not present.

The use of cooperative student groups in the classroom influences a variety of cognitive (see Table 1) as well as affective student outcomes. The possible classroom situations in which teachers may desire to use student-student cooperation to foster student motivation toward the learning task are many. The advantages in using student-student cooperation are also many and will be discussed more extensively in the next section.

Motivation Through Competition

The use of teacher directed student competition, both interpersonal and intergroup, can be effective in increasing student motivation. When all students competing believe they have an equal chance of winning, competition will be effective in increasing student motivation. When teacher directed student competition is correctly implemented, student outcomes can indeed be influenced positively (see Table 1). The classroom situations and conditions in which teacher directed student competition can be used will also be discussed in the next section.

Motivation Through Games

Probably not much needs to be said by way of introduction with regard to the use of mathematical games in the classroom for motivational purposes. The number and types of games which have been produced for use in mathematics classrooms is overwhelming, and research has shown them very useful in terms of helping achieve

certain student outcomes (see Table 1) as well as motivating students when used in appropriate ways. It can be seen from Table 1 that the use of games in the classroom cannot be completely isolated from the use of the other two motivation strategies introduced above. The methods for using games in the mathematics classroom which have been found to be effective will be discussed in Section II.

Table 1

Motivational Strategies and Cognitive Outcomes

Cognitive Outcome	Cooperative	Competition	Games
Mastery of factual information			X
Retention, application, and transfer of factual information, concepts, principles	X		X
Mastery of concepts and principles	X		X
Verbal abilities	X		X
Problem-solving ability and success	X		X
Cooperative skills	X		X
Creative ability: divergent and risk-taking thinking, productive controversy	X		X
Awareness and utilization of one's capabilities	X		X
Perspective- (role-) taking abilities	X		X
Speed and quantity of work on simple drill activities		X	X
Competitive skills		X	X

(Adapted from Johnson & Johnson, 1975)

The Use of Grouping for Cooperation as a Motivational Strategy

In almost any classroom, the teacher needs to decide just how students should be grouped in order to facilitate the learning process. Most teachers realize that certain types of student groupings can be used to motivate certain students. In most cases, motivation to do the required assignment is evident when student-student cooperation is high. In order for students to be cooperative with each other, it is usually necessary that students be grouped in other than large group fashion.

The grouping of students in order to facilitate cooperative behavior can be accomplished in any one of a number of ways. A rule of thumb, however, is that the more heterogeneous the grouping, the better. That means grouping students on as many factors as possible. It is good to avoid situations in which student groups are made up of individuals with the same ability, the same motivation level, the same sex, etc. (except in the case of interpersonal competition which will be discussed later).

Several methods can be used to assign students to heterogeneous groups. Random assignment, in which all students in the class are randomly assigned to a specific group, is a reliable way of insuring adequate heterogeneity. You as teacher can assure that each student group is well mixed if you assign each student to a group on the basis of some pre-determined information which you have on each student (e.g., ability, motivation). In some cases, it will not

be feasible to assign students to groups on the basis of all factors which might be used. In such instances, the best one can do is assign students to groups using as many factors as practical.

All this brings us to the point where one can say with relative certainty, if one desires to motivate students through the use of particular grouping practices meant to facilitate cooperation, small groups are best. Yet one question remains unanswered. What is the optimal size for such a group?

What is the optimal size for a cooperative group? The most difficult decisions about the size of groups arise when you use a cooperative goal structure. The optimal size of a group will vary according to the desired processes and outcomes of the assignment, the age of students, the experience students have had in working together, the possibilities for a division of labor, and the number of students in your class. Small groups of six to ten members have been used successfully for cooperative tasks. The group is small enough to allow everyone to take an active part in the discussion, yet large enough to provide the diversity of opinions, information, points of view, and background needed for effective problem solving. Groups larger than ten may have "air time" problems in that all group members may not have enough time to express themselves. When there is limited time available in these larger groups, there may be competition for time to speak or, conversely, students may "opt out." In problem-solving activities, a group size that maximizes each member's participation is preferable, and this may mean using pairs or triads for tasks that require high involvement and are not easily broken down into a division of labor. On the other hand, bringing the whole class together to share ideas and results is sometimes necessary. No rule of thumb is possible in deciding what size group to utilize; the teacher simply has to experiment to determine what size works best for a particular purpose.

One strategy for insuring total participation and the chance for each student to develop interaction skills is to start the class out in dyads. When they have arrived at an answer, instruct each dyad to joint with another dyad

and discuss the issue in this group of four until they arrive at an appropriate answer. Proceed to combine groups until the total class is meeting as one group. Although this takes some time to accomplish, the payoff in active participation and involvement may well be worth it, and it gives the teacher a chance to watch students in action in a variety of groups. This exercise may answer some questions you have about optimal group size with your class.
(Adapted from Johnson & Johnson, 1975)

It should be emphasized that the effective use of grouping in the classroom requires pre-planning on your part. Use the information about individual students you have when you plan for the particular grouping structure you want to use. The effect of pre-planning will be to enhance the quality of the classroom environment, both organizational and interactive.

The Use of Teacher Directed Student Competition as a Motivational Strategy

When teacher directed student competition is used correctly, it has been shown to be effective in motivating students as well as increasing student learning. The following discussion attempts to explain those types of situations in which teacher directed student competition becomes effective. Two types of competition will be discussed: interpersonal and intergroup.

Interpersonal Competition

Interpersonal competition can be effective in increasing student motivation when certain conditions are met;

First, competition is effective in increasing student performance on a simple drill activity or a speed-related task when sheer quantity of work is desired on a project that requires little or no help from another person; spelling, vocabulary, math drills, writing practice, word recognition, recall of

facts and dates, hand-eye coordination, and athletic contests are examples of such tasks. When the instructional goals are to review, drill, or achieve quantity on a simple task, the teacher will wish to use competition. Second, when competition takes place during low-anxiety-producing, relatively unimportant activities, it often is a source of fun, excitement, and a release of energy. People commonly seek out competition under low-anxiety-producing conditions and enjoy it immensely. Games like Monopoly, poker, checkers, and bridge, sports like tennis, golf, and bowling, and such activities as movie and playgoing and reading provide competitive experiences either directly or vicariously. Physical competition in which students have a chance to be boisterous are involving, exciting, and fun, even for spectators. When winning or losing does not create a great deal of anxiety for any of the participants, there seems to be a sense of pleasure in matching one's skills and abilities against those of one's peers. When the task is not a life and death matter, one should expect to enjoy the interaction -- win or lose.

Third, when there are no set criteria by which students can evaluate their skills and abilities there may be a self-evaluatory drive toward comparing oneself with others to obtain an accurate appraisal of oneself. Sometimes students may wish to compete in order to appraise their skills, make comparative judgments, and learn what they are really capable of doing. But if comparisons are going to be made, it is important for each student to keep track of how the competition is going. The fourth condition, therefore, is that each student is able to monitor the progress of his competitors. Fifth, students will be motivated by the competitive goal structure when they believe that they have a reasonable chance of winning. Sixth, there must be clear criteria concerning what is a right or a wrong answer. Finally, competition will run smoothly when clear procedures of arbitrating arguments and determining winners is set up and communicated to the students.

Inter-Group Competition

The conditions under which a teacher may wish to use intergroup competition may be more common than the conditions under which a teacher may wish to use interpersonal competition. Everything stated above about interpersonal competition applies to intergroup competition also. But there is evidence that association with a group cushions the normal effects of failure: when a group loses, the loss may be taken less personally by each of the group's members. ...many of the benefits of cooperation may be obtained when groups compete. Some aspects of intergroup competition may enable a teacher to increase control over the classroom behavior of students and increase the influence of academic norms on students' behavior.

Intergroup competition may promote peer group pressure for academic achievement. When there is a great deal of conflict and hostility among class members, placing enemies in a cooperative group that engages in competition with other groups may do much to resolve the conflict.

When even small failures may damage student self-attitudes, when teachers want to promote both cooperation and competition simultaneously, to encourage peer group pressure for academic achievement, and to reduce interpersonal hostility, they may wish to use intergroup competition for instructional purposes.

Some teachers prefer the use of intergroup competition in their classrooms. How do they structure such a situation? First, groups are formed within the classroom that are heterogeneous in terms of ability and equally matched across groups. This can be done either through random assignment to groups or by ranking the students in terms of achievement and then randomly assigning students to groups so that each group has an equal number of high, middle, and low pretest students. Six members is a good size for competing groups. Second, the classroom groups compete with each other for rewards given to the highest achieving and best behaved group. Third, since the outcomes of a group depend upon the group average (or average of the lower half of the group) the entire group benefits or suffers as a consequence of the conduct of individual members. This encourages tutoring and helping among the students. The teacher may wish to review the skills and procedures needed for tutoring within each group with the students and to highlight the importance of cooperation within the group. Fourth, it is important for the teacher to ensure that the intergroup competition does not become so strong that it outweighs the intragroup cooperation. Once competition becomes too serious, all the destructive outcomes of competition will appear, and students resort to bickering, scapegoating, and negative interpersonal relationships. As the saying goes, "It's not whether you win or lose, it's how you play the game." The corollary in this situation would be, "It's not how fiercely you compete with the other groups, it's how comfortably you cooperate with your teammates." What you are losing when you use intergroup competition is the flow of ideas and materials between groups and the overall class possibility of a division of labor. In this combination of cooperation and competition, you need to make clear two sets of expectations: cooperation within the group and competition between the groups.

(Adapted from Johnson & Johnson, 1975)

It is important to emphasize that when competition is used, the make-up of student groups can be considerably different than

when cooperation is the goal. Intergroup competition requires groups which are somewhat homogeneous in nature; especially where ability is concerned. Intergroup competition, on the other hand, can easily make use of heterogeneous groups already formed.

The Use of Games as a Motivational Strategy

The number and types of mathematical games which have been used in mathematics classrooms is staggering. The DMP topic which you will be teaching has games appropriate to the topic provided, the use of which is optional. However, if you have games which you like to use, feel free to use them.

Mathematical games have been found to be effective in increasing student motivation. In most cases they are fun. Also, games provide a useful way of reinforcing mathematical concepts already presented. Games can be used a variety of ways in the classroom. For example, they can be used as rewards for those students who have performed adequately. Such a procedure is not generally recommended, however, since the students for whom games would be most effective, most likely would never get to play them. Games can be used as activities to fill time which otherwise might be empty. Games can also be used as class activities in themselves. This is especially true when the teacher desires to review a particular concept. Drill work can be much more likable when put in the format of a game.

It is important to understand that students should be made aware of why they are playing the game; to help them learn something about mathematics and to have fun while they do it. It is equally important that a game generally be used in a particular sequence of classroom events which are planned for. As one author has put it, "When selecting a game or puzzle for classroom use,

the teacher should make his or her selection because the game or puzzle can serve a particular purpose related to the mathematical content to be studied" (Smith & Backman, 1975). Random use of games, while possibly motivating, may not increase mathematics achievement. The following is a summary of those ideas which teachers should keep in mind before using a mathematical game:

The success of an arithmetic game, like any classroom material or technique, is highly dependent on how it is used. If an arithmetic game is to serve a real function it should be used at the right time, for the right purpose, in the right way.

1. Select a game according to the needs of the class. The basic criteria is that the game make a unique contribution to learning of arithmetic that cannot be attained as well or better by any other material or technique. The material of the game should be closely related to that of the regular classwork. Whatever game is selected should involve important skills and concepts. Major emphasis should be on the learning of concepts or skills rather than on the pleasure of playing the game itself.
2. Use the game at the proper time. If games are to make the maximum contribution to the learning of arithmetic they should be used at the time when the ideas or skills are being taught or reviewed. However, many teachers prefer to use games after completing a topic, on the day before a vacation, or during the pupils free time at noon, in study periods or homerooms. Others use them during days of heavy absence due to storms, concerts, or excursions. Some teachers use them as rewards for work well done while others use them for remedial work. Usually games should be played a relatively short time so that pupils do not lose interest.
3. Arrange the game situation so that ALL pupils will be participating in every play. Even though only one person is working on a certain problem at a given time every team member must be responsible for its solution too. Games must also avoid embarrassing the person who cannot solve a problem. Keep comments positive, commend good work rather than making unfavorable comparisons. Whenever possible pupils should compete with their peers, and should be

working on material according to their ability.

4. Plan and organize the game carefully so that the informality and excitement of the setting does not defeat its purpose. Teach the playing of games in a planned, organized way as you would present other activities. Have all the materials at hand so that the game can proceed in an orderly fashion. When a new, complex game is being played, start with a few essential rules and then add other rules as they are needed during the game. Use a few practice plays to help get started. Then expect good work, as neat and accurate as regular classwork. Pupils may referee the competition as well as play the game. Before beginning the game the participants should be instructed on the purpose of the game, the rules of the game, and the way to participate. Often the pupils can establish ground rules, so that everyone (including the teacher) may enjoy the activities. "Coaching" or "kibitzing" should never be allowed. The loss of points for the breaking of rules will usually be sufficient to maintain appropriate behavior. Avoid the choosing of team members by pupil captains so that low ability pupils will not be embarrassed by being last choice.

5. Emphasize the responsibility of learning something from the game. Follow-up activities such as discussions, readings, or tests will emphasize this responsibility. As the teacher, evaluate the results by asking yourself how successful the game was in promoting desired learning.

(Adapted from Smith & Backman, 1975)

Probably the most important idea above is point four. It is essential that the use of games in the classroom be planned and organized. Without such planning, the chances of achievement of desirable student outcomes are severely diminished.

Deciding what games to use with which students is a decision which you yourself have to make. Some games are more appropriate in large group situations. Others are more appropriate for small groups. The important thing to realize is that games by nature are competitive. As such, the basic notions discussed

earlier under competition apply. Grouping for games should be decided upon by paying attention to individual student differences. For example, a heterogeneous ability grouping would probably not be advised for any games used. It is best that when games are used, all participants in a group have an equal opportunity of success. Finally, it should be remembered that games are particularly useful for students who have trouble becoming motivated to do their mathematics lesson, and when used as outlined above, have been shown to be very effective in increasing student motivation and achievement.

Summary and Conclusions

Three motivational strategies which could be used in mathematics classrooms were discussed: (1) the use of student grouping to promote cooperative behavior, (2) the use of teacher directed student competition, and (3) the use of mathematical games appropriate to the topic being taught. All three strategies were chosen primarily because of the ease with which each one might be implemented in the classroom.

It is very important to understand that these strategies can be used to help individual students in your class develop more favorable attitudes toward mathematics as well as to help individual students increase their mathematics achievement. However, it is equally important to realize that the effectiveness of such strategies is largely dependent on adequate planning for their use. It should be clear that not all students in

your class will need to be motivated to the extent that others might. Not all motivational strategies will be equally effective in some situations. Your job, basically, is to use the information about individual students which you have and plan your lessons so that individual student needs and differences are taken into account. It is believed that the strategies presented above will help you accomplish that task.

APPENDIX H

1. Teacher Interview Questions
2. Teacher Interviews
3. Class Descriptions

TEACHER INTERVIEW QUESTIONS

1. How many years teaching experience do you have?
2. Is this the topic you usually teach at this time? If not, what do you usually teach?
3. Do you think this topic was appropriate to teach at this time? If not, when would you have taught it?
4. Did you feel comfortable teaching this topic? Why or why not?
5. Do you think your students were well prepared for this topic?
6. Do you think that two weeks is enough time for this topic? If not, why not? What activity did you get through?
7. Was the planning you did for this topic different from the planning you usually do? If so, how?
8. Did you follow the materials closely or did you improvise? Why?
9. Are the materials you used for this topic similar to those you usually have available? If not, how are they different?
10. Do you feel that the information about your students given to you at the beginning was useful? Why or why not?
11. Do you feel that the motivational strategies given to you at the beginning were useful? Why or why not?
12. Are there any other comments you would like to make?

Question 10 was asked of teachers in treatments one and two.

Question 11 was asked only of teachers in treatment one.

INTERVIEW - TEACHER 1

How many years teaching experience do you have?

24 years

Is this the topic you usually teach at this time?

Not usually. This topic is usually done more toward the end of the fifth-grade year.

What do you usually teach right now at the beginning of the year?

First, we review addition then subtraction and then multiplication. I have an average group and all the students in that group should have accomplished learning all the facts for multiplication. So we do run through reviews first, but then before very long, we go right into applying multiplication such as multiplying a one place number times a four place number and then two place multiplier; then into division; likewise the one place divider, two place divider; so on. Fractions usually is one of the last projects of the year.

Do you think that this topic was appropriate to teach at this time?

No, they just didn't have the background, that's what really slowed me up. Some of the things I would have expected that they would know because they do have a background. They do have a unit in it every year, but it was not there.

Did you feel comfortable teaching the topic?

Oh, yes.

Do you think your students were well prepared for this topic?

Some of them. Because of it being heterogeneous, first of all, the lower students evidently just did not accomplish those basic underlined principles they would have had to know even though they have been exposed before. They just either don't retain it or they hadn't actually learned it the first time.

Do you think that two weeks is enough time for this topic?

Oh, no way. There's too many concepts in that unit to accomplish in two weeks. (You just started on Activity E today, right?)

Was the planning you did for this topic different from the planning you usually do?

Essentially not, except the feeling that it is a special kind of a project. I think I probably put more time into it and tried to study the manual so that I was doing exactly what the manual suggested. Whereas, when you do your regular daily planning, once you are familiar with the material, texts, and that sort of thing, you kind of adjust that to the kids and to your style and so on. I think that was the only difference. I was trying to adhere directly to the guide.

Did you follow the materials closely?

Yes.

Did you do any improvising at all?

Not a lot. I would say very minimal.

Are the materials you used for this topic similar to those you usually have available?

Yes.

What kind of materials do you have normally?

We have the Scott Foresman text, but we supplemented with a lot of homemade sort of things too.

Do you have any comments about it in general?

My strongest feeling was that I just was trying to accomplish far more than I knew I could manage; kind of frustrating at the end of two weeks. It's frustrating to know on Monday when those kids take that test they will just bomb out. I figure it was throwing too many concepts at them. Some of them had not mastered the first concept of equivalent fractions before we went into today's work; mixed numbers to equivalent and improper fractions. They were still floundering around with trying to picture in their mind and to somehow set up the way to do it; just in equivalence; some of them were just getting the dawn on that. They needed more practice. Like in the traditional sense. If that really were my math class, after about the second or third day those kids that have already picked up the concept as you would turn them loose with something else and then give one-to-one help or some other supplemental time; work with those kids who just didn't get it so that you weren't continually spending the same time and the same material. I was amazed that some of them did really start

getting a little fussy because you could tell they just -- oh, you know -- (Here we go again, huh?) Right. Same thing. And besides by that time you're trying out the ones you think are not accomplishing. So when you ask them and they just simply don't come up with the answer and it takes so long, the better students that have seen that answer -- I thought they were very generous in their attention. I was really pleased with their behavior. Normally that gets to be a class where you get troubles, discipline wise. They were very good. (Were you able to pick out very easily the kids who you knew were having difficulty?) Oh, yes. (Some of the pretesting that we did for the students; that was some of the information we gave to some of the teachers, about the pretest results, so they had a little bit more information about their students than you did and so right from the very beginning they kind of had an idea of who was who, because we gave them the competency scores from last year and also gave the problem solving scores.) I'm sure they would know probably before they had the first class. Whereas it took me probably I would say two or three days but--(It doesn't take long.) No, you can pick them out very soon. (Is there anything else?) No, I thought it was interesting -- the fun part about being in the dark -- not really understanding some of the reasons and motivation behind all of this. Obviously you begin to think about it and see if you can

piece things together yourself. kept telling me
that someday we'd all know. The thing that I did think about
was that it was good for me to take part in this thing because
all the while I was working with it I would think it forced me
to be very critical about my own techniques and preparation and
that sort of thing which is good for the older teacher. (So
you spent more time thinking about your own teaching.) Right,
I think you evaluate some of the things you are doing because
obviously, in an experimental situation like this you are thinking
of wanting everything to come off just as great as you could,
so I thought of it as a fringe benefit for myself.

INTERVIEW - TEACHER 2

How many years teaching experience do you have?

18 years.

Is this the topic that you usually teach at this time?

Oh, no.

When do you usually teach fractions?

Probably toward the end of the year. These kids come in and really haven't had much fractions at all.

Do you think that this topic was appropriate to teach at this time?

No, not at all.

When would you have taught it?

This program I would feel comfortable with it at the end of the year. This was kind of unreal, because these kids didn't have a chance to brush up on any of the basics. I did have lots of trouble with even multiplication facts and so on even though they are sharp kids they forgot over the summer.

You didn't really feel comfortable teaching the topic?

No, no I didn't, because I just felt it was kind of out of place.

Do you think your students were well prepared for the topic?

Not really, no; not enough time to get adjusted to school. That's a big thing there; get to know me -- didn't know what to expect or anything.

You probably didn't think that two weeks was enough time.

No, I'm not finished with it.

What activity did you get through?

I'm on E; just starting on E. And that's with the faster group now, I divided them and I guess some kids are not going to approach E today.

Was the planning that you did for this topic different from the planning you usually do?

Not really, no; basically the same. Except maybe the going from the guide to the booklet for me once in awhile goofed me up. With the color code; I know it was color coded with red and black, but I would once in awhile mix those up. But no big problem.

Did you follow the materials closely or did you improvise?

I followed the materials and tried to follow the booklet suggestions they had in there. Once in awhile the kids remembered some of the things last year; the fractions. And of course they were probably approaching it from a little different angle so then we did have to say hey, yeah, solve the problems that way, your way, and we'll go the book way or the other way with the other kids. Yeah, we had to improvise a little bit once in awhile, but not much. I tried to stay with the booklet.

Are the materials you used for the topic similar to materials you usually have available?

No, our textbook does not provide that, no. Those things we have to get on our own. We didn't have that.

Do you feel that the information about your students that was given to you at the beginning was useful?

I don't know. Not really. I guess because I kept them in a large group until I found who had troubles. Then as I divided them into those kids that bogged down; had the problems. Then I did look on the sheet just for curiosity sake and all of those were registered low except for one. It was interesting to note that.

What reactions do you have about this in general?

I would say first, I think we should have sent something out to the parent because we had some kids going home that were not very comfortable with this math right at this time because they just were kind of lost; a few of them were, and then go home and the parents are saying, "gee, fractions right away." I have a couple of friends who have their kids in my room that are teachers and they say, "what are you doing with fractions?" They know that. I say well hey, it's an experiment thing. They said they felt as though a letter to them explaining this would be helpful and then they would have understood why their little Johnny was having a little problem. So I think mailing a letter home would have helped. (We had one prepared; it was the fact that Lois never mentioned anything about it and I probably should have brought it up myself.) Better PR as far as the parents are concerned, I know we have PTA coming up Tuesday night and I know I'm going to get a lot of questions on this, I can explain it. (If you want

to you can tell them that it will be great for when they really get it then.) Really. At the end of the year we're going to breeze through fractions; yeah. We should be able to go over that unit quite quickly. (Any other things you can think of right off hand?) All I can say is this is a very difficult subject; it was very difficult for them, I just think that the work itself was really challenging even though I had the sharper math kids and at this time and place in the year. At the end of the year the same group would go through this material really quite well. Right now it's really difficult. I think even the problems were hard. The concepts are hard. Quite advanced for probably -- I always consider these kids fourth graders yet. Otherwise I think everything turned out OK.

INTERVIEW - TEACHER 3

How many years teaching experience do you have?

This is my 16th year.

Is this the topic you usually teach at this time?

No, we don't start this way.

What do you usually teach?

We usually start sort of in review. Fourth grade with subtraction, addition, basics although we don't spend a lot of time with it for those who don't need it, but then go on to multiplication, division; then fractions and other things.

Do you think the topic was appropriate at this time?

Well, not really, at least not for some of the kids who are not good math students. I think starting at the beginning of the year like this was something that was a little more abstract than the basic things which some of them still need a lot of practice in, kind of maybe discourages them a little bit and they don't find that initial success. Maybe they don't like math that much to begin with and here they are faced with trying to solve fraction kind of problems; a lot more abstract. So it's kind of discouraging for those who are maybe not as good in math. For the ones that are average and better than average, they were able to do, I think, pretty well.

When do you usually teach fractions?

Again, it depends on the student. Some students will get to it

earlier. (You're in an individualized program here?) Well, we're kind of. The fifth-grade we really sort of group by ability, more than anything else. We've got kids that are in a lower group that will probably work more individually than in the higher group. The higher and lower groups will probably work more individually if they're grouped and the lower ones will get to it later because they need more work on the basic kind of things. The good kids, average kids will get to it much sooner.

Did you feel comfortable teaching the topic?

Yes, I felt comfortable teaching it. It didn't bother me to do it.

Do you think your students as a whole were well prepared?

No, I don't think they were. I think the good kids probably had more background than the other ones and I don't really think -- sort of -- sort of starting from scratch.

You probably didn't think that two weeks was enough time for the topic.

No, I didn't. Especially for average and for those who are having more problems; kind of rushed and frankly some did go farther than others - because of the way I worked it. But I think if I could have had more time -- if I were working with kids who were having more problems I would not do it in this kind of a crash course. I would probably go about it a little more differently.

What activity did you get through in the book?

Everybody got through D and some kids got into E on their own more or less.

Was the planning you did for this topic different from the planning you usually do for math?

Well, it was maybe not really different. Probably the only way it was different I suppose would be in the fact that I had to maybe keep a little more careful notes because I wanted to have it written down so that I could give you a copy of it. As far as planning, I basically do the same kind of thing if I'm having a normal class, but I didn't record it probably as accurately or as thoroughly.

Did you follow the materials closely, or did you improvise?

I did some of each. I tried to follow the materials and then where I thought I could interject something that I thought would work better or maybe would help some kids where the other materials that were in the book and so forth might not -- I did use my own ideas to try to get the message across. (Did that take the form of handouts like worksheets or anything of that nature?)

I use a couple. I used some of my own worksheets where I thought kids were especially having problems. They could see it a little differently if I put it in my own worksheet; other than using the problem. Sometimes I thought the format that the book used, because these kids are not used to using this kind of book;

directions and kind of ways even though they may know how to do the problem; the way the problems were laid out; in terms of the directions and so forth; because these kids have never used this DMP material, caused problems in interpretation. Then you could explain "well this is really what they mean." Then they could get it. (It was kind of hard for the kids to follow the materials?) Well, some of them.

Are the materials you used for this topic similar to those you usually have available?

Basically the worksheet kinds of things are always available in the program. We use Scott Foresman and they have that same kind of material. You can have the regular worksheets that go along with the manual and you have the supplementary kind of worksheets and things that you can use. (Do you supplement your regular math program a lot like say games and stuff like that?) Some, yes; especially where there's a need. It serves that purpose.

Do you feel that the information that was given to you about your students at the beginning was useful?

Well, I think it was probably confirmed what I already knew from just having worked with them a week or more and knowing these kids from past years and that kind of thing. I worked with these kids in other activities and you get to know their abilities even though it is not in a classroom situation. I pretty much

agreed with what you had found out with the test results and it pretty much correlated with what I had already determined. (You're not the only teacher who has said that. I don't know exactly what that means, but it means to me that the test that we gave, the problem solving especially, is in some way indicative of their actual ability. We would expect that it would correlate highly with their regular math ability; we didn't test that, but I would expect that's true. There should be some correlation there. So it did basically confirm what you already knew.) Yes. It confirmed more than giving me a new idea or a new thought about certain kids. Maybe there were a couple that were different than what I thought of, but most of them were pretty much the same.

Do you feel that the information about the motivation strategies given to you at the beginning was useful? Did you use that any?

Well, I agree with it. I tried to use it in terms of having students work with each other and some help others; cooperation kind of thing. I found the two week period, that we were going to have to get through the topics kind of things, that you couldn't really afford a lot of you know like as much experimentation with that kind of idea as I would like to if you were going to cover the materials. I think if we would have had more time you could set up something like that a little easier but I agree with it. My own personal feelings about it, the philosophy

behind the motivation techniques and so forth, use of games and use of competition in certain ways and the cooperation kind of thing, I think sort of goes along with the way I feel about it. But I probably did not use it as much as I would have liked to or could have if I would have had more time.

INTERVIEW - TEACHER 4

How many years teaching experience do you have?

10 years.

Is this the topic you usually teach at this time?

No.

What do you usually teach?

Normally we start with basic number facts and review those. Then we move into the beginning of a number system. There might be some background work in Roman Numerals and then go into the addition and subtraction and multiplication and then start to move into beginning division. Then fractions would appear. The first time we would touch fractions would be somewhere around December. We touch it in three stages throughout the year.

Do you think this topic was appropriate to teach at the time?

No. (Why?) I think it assumes some background knowledge that the kids did not have, plus the fact that they have come into school cold and are expected to do rather complex kind of operations without the benefit of having refreshed their knowledge that they've lost over the summer. Some things they have simply forgotten. I would rather have seen it taught after review of multiplication, division, and that sort of thing, and even some basic fraction review.

Did you feel comfortable teaching the topic

Oh yeah, other than the fact that I thought it was out of line,

but I felt comfortable doing it. No problem.

You didn't think your students were well prepared for the topic.

No, I didn't. Looking back into the program that they were in last year and what is presented, this program assumes that they have some background knowledge that these kids actually did not have.

You probably did not think that two weeks was enough time.

No, I didn't come close to covering the minimum five units.

What activity did you get done?

We finished 71A, 71B, and we just began 71C; putting together of addition sentences. We just began that.

Was the planning you did for this topic different from the planning you usually do?

It took longer to do it simply because I was not familiar with the program. The kinds of activities were different in the effect that there were more small group game activities than what I might normally have done. Some of the things that we did were things from the program that we normally use. The SRA program, and I did pull those out. We would have done those anyhow. But for example, I had a game period, I believe, everyday. The last five or ten minutes we reserved for games. That's something I wouldn't normally do. We may play some games throughout the course of the week, but to do it on a everyday basis I wouldn't have done that.

Did you follow the materials closely?

As closely as I could.

Did you improvise any at all?

Today's introduction to fractions I improvised. We played a game today to introduce that concept rather than do the work out of the student guide.

Are the materials you used for this topic similar to those you usually have available?

Yes, they are similar. They are not exactly the same, but certainly the games are. The cubes I have are not part of the program that we use, but they are supplemental materials that we have gone out and purchased over the past years. We do use some of the type of techniques that the DMP uses.

Do you feel that the information about your students given to you at the beginning was useful?

Not really. Having seen these kids in school for the five years and having pretty much close contact with them as fourth graders because there is a lot of communication that goes on between the grades here, I probably could have grouped them pretty closely to the way the test came out even without the benefit of that test. Certainly with the new ones it probably helped. It just reinforced what I already knew. So the testing was beneficial in that way. It reinforced some things that I was thinking. Of course there are always one or two that you are

wrong on, but by and large they fell just about where I would have expected them to fall.

How about the motivation strategies, were those useful do you think?

The introductory motivational things? Yes, but it wasn't a lot different from what I would normally do. The large group things, get the cubes out, let's make these things, that sort of thing, we do anyway. I think that's just good sound teaching, so I would have done that anyway.

What kind of comments do you have?

I just randomly put down some comments. They are not in any particular order, but just some things that I thought I should mention. One we covered already. That's the students in my class were presupposed to have some background. For example on page 17 of this guide it says in Topic 67 children began to use open sentences to solve problems about joining and separating fractional parts. When an open sentence involved different kinds of fractional parts $\frac{3}{4}$ and $\frac{1}{8}$, the children rewrote using equivalent fractions. These kids haven't done that. They haven't done that at all. This presupposes that they had some experience with that. As a result we spent all of last week on section A. Now, that's alright because I wasn't worried about finishing this up. If we got through it, we got through it, if not, fine. But I found I had to do a lot more background type

preparation than before. I thought that the amount of work that the DMP suggested, at least not knowing some of those things that were crossed out in the book; I didn't know if we were to use those or if they were only to be used with small groups, the grouping strategies and that sort of thing, was an awful lot. If you were expected to do all of the work in the workbook and in the guide it was just far too much. Especially considering the 35-minute period; far too much to do. Now if you didn't do some of it that might work better, but in my case I needed all of that material to provide the background. As a result, that's another reason that we were so late. The games I thought were great. I liked some of those games that they had there and the manipulatives are nice, I like those little centimeter cubes. I hope that you are going to leave that with me. In fact, I'll say that on tape. (I don't know yet.) I wish that the class period could have been longer. The 35-minutes that we taught was too short. Forty-five minutes would have been better because it would have allowed me to present a 30-minute lesson to the kids and then allowed an adequate time for the game period at the end. What happened all too often was the topic that we were talking about and using manipulatives or whatever, it would up take up 30 minutes of the class and I only had five minutes left for games which really wasn't enough time to let them get into the game and play it. The only other problem that I found here is

that with all of the small groups and with the large use of games and with the excitement that those games generate, it was tough to keep the noise level down, which in a normal self-contained classroom wouldn't bother me. But out here in the open concept school, poor on the other side of the divider. You know, I think he's as happy as I am that this program is over. And the kids were having fun and you don't like to jump on them and say, "now quiet down, quiet down." But on the other hand we have to respect our neighbors, so to speak, and we had a problem there. I think that as you look at the overall study, I didn't enjoy the opening of it. Not the way the thing was structured, but the initial meeting that took place. I think that that should have been conducted before school began; the first week of school,

INTERVIEW - TEACHER 5

How many years teaching experience do you have?

19. This is my 20th year.

Is this the topic you usually teach at this time?

No, not usually at this time of year. Usually at this time of the year we spend some time reviewing the four basic operations, and usually multiplication is the thing that we have to work on in any depth at first; then small and whole numbers. Although they have had it, the usually need to review it.

Do you think this topic was appropriate to teach at this time?

It was difficult for the lower children because some of them weren't probably ready for it. But most of the kids I think were OK. It was kind of nice to work with this topic because it helped you find out which children--helped you to find out how to group children more quickly than when you are reviewing topics that they already know. You quickly picked out those that were having difficulty with the thought processes. So in that respect it was kind of nice because we do group the kids later on and I think I am able to group them quite accurately now.

Did you feel comfortable teaching the topic?

Yes. Their approach was a little different than what I would have used, but it was kind of fun to try a different approach. It was good because I think it pointed out very quickly children

who looked for a process without thinking and those who think. You could pick out the ones who are able to think through things logically.

Do you think on a whole your students were well prepared for the topic?

The top 11 seemed to be well prepared; they seemed to be able to handle it quite well. Then the group that was a little bit lower had some difficulty, but with extra help, and teacher made activity sheets, they were, I think, OK. I felt the two low ones were not really prepared for it, although they pleased me in that they could eventually draw pictures of their own to find equivalent fractions. They were able to do that.

Do you think that two weeks is enough time for the topic?

For the top ones, yes. For the seven that were in the more average group, they could use a little more time, and of course the low ones can use a lot more time.

What activity did you get through?

The two lowest ones only got as far as activity B. They were able at the end of two weeks to draw pictures on their own. Otherwise they use concrete materials and partially drawn pictures. The next group was sort of an average group. They got into Activity C so they had added and subtracted fractions. They began to work with story problems using fractions and other sentences. And the top group, many of them got into D where they were starting to work.

Not many, I'd say maybe four or five of them got into working with improper fractions. Most of the kids were exposed to at least four objectives.

Was the planning you did for this topic different than that you usually do for math?

Somewhat different I think, because I felt the materials here did not always meet the needs of the slower children. So I had to make up more things than I might ordinarily have done.

In the other textbook series there were more materials to choose from. I felt for example that even with the average group when it came to adding and subtracting fractions they threw three different types of problems at them on the first page and so I felt that they needed to work one type at a time until they mastered it and that required more preparation. Actually I had to do more preparation. Ordinarily, after we split groups I usually take the average group. So I don't have the real high and the real low. I had all three groups. In all of these different levels in my class I had to prepare for each one so it required more than it would if I just had an average group.

Did you follow the materials fairly closely or did you improvise?

I tried to follow their method of thinking through problems and so on. I eventually digressed from the symbolic finding of equivalent fractions. I would say half the children were thinking through the steps and understanding it so then I brought in the

idea of multiplying fractions by a form of one and this helped, I think, those who weren't able to think through the steps in their mind.

You did improvise with some of the lower kids.

I did that with the average and the slower kids. Each of them had a fraction kit that we used in the beginning which was not part of the material. These were homemade. The first thing that we did because I didn't know what they knew about fractions, was to use the pieces to discover how many fourths were in the half, which was larger, a half or a third. Then the lower group used those pieces for the entire first week and going into the second. They weren't able to picture in their mind to draw pictures. Eventually they got away from that and were able to draw the pictures.

Are the materials you used for this topic similar to those you usually have available?

No. Well, there are likenesses, but as I said, the materials that I have available go a little more slowly than this. Of course we add the games sort of things. The only thing is we didn't get a chance to use too many of those. We didn't get that far. The only game that we got a chance to play was Fraco which the top group did. I didn't give it to the lower average kids because they weren't able to do it in their minds that easily.

Do you feel that the information about your students which we gave you at the beginning was useful to you?

I wouldn't have really needed it. I grouped them according to how they seemed to be mastering the topic and I found that the groups did not match perfectly with what you had said. Some of the kids that you had indicated as being low did quite well on the topic. I guess that was the exception. I don't think I had any top kids that you had indicated as being top put into a lower group. I think I could have done just as well without it because after the first three days it was readily apparent which kids were understanding and which weren't. I think the third or fourth day I had them grouped according to ability. Then I had to change one; from the average group to a lower because he had been copying the first couple of days.

What about your reactions to this whole thing? Do you have any comments?

I was sort of in the dark as to exactly what it was you were trying to find out which is the way it was suppose to be. I wondered about all of the variables. I didn't know exactly what you were trying to find out, but I did, too, wonder about the variables and how those were all going to be controlled with the different kinds of groups working type of thing; realizing that it is difficult to control all of them when you have nine different classrooms that are working. I know like for example

class; everybody was all top kids which would be a variable from people who have only low or mixed. So I was just wondering; it seemed like there were so many variables.

INTERVIEW - TEACHER 6

How many years teaching experience do you have?

This is number 8

This is not the topic you usually teach at this time, is it?

No.

What do you usually teach at this time?

I usually start out with a review of multiplication for those kids who need it. I usually set my program up based on the teacher's recommendations from last year plus the minimum competency test or any other tests such as the Iowa test. Then I usually sit down with the kids and try to zero in on where they are having difficulty. I believe that all math is a sequential type of thing. I just find where in that sequence are they having difficulty and that's where I usually start them. You can have a class of 30 kids and all 30 in different places and two or three different books.

Do you think this topic was appropriate to teach at this time?

For some of the kids. I had some problems with a couple of kids who don't know their multiplication tables. You think of finding multiples or factors, common factors and things like that in the fraction work, but your going to run into problems if they don't know their multiplication.

When do you usually teach fractions to say the majority of the kids?

If you were on a four quarter basis, I would say the second and third

quarters.

Did you feel comfortable teaching the topic?

I like teaching it because with the individual approach that I use, I don't get up in front of the room and shoot my mouth off.

This gave me a chance to do it. I enjoyed that part of it.

Do you think most of your students were well prepared for this topic?

I would think that the majority of the kids have had good preparation; as fourth graders. But then again some of the lower students had difficulty with the multiplication. As far as the concepts involved, I think that the concepts are easy enough to understand. We do need certain skills to be able to deal with some of those concepts.

Do you think that two weeks is enough time for the topic?

No. Definitely not.

What activity did you get through in the book?

I got through E. I thought I didn't have any other choice but to get through E. (Well, the reason we wanted you to get through that if possible was because the test was going to be up to that. We didn't want the kids to be so frustrated that they would have problems on the test, but it was not absolutely necessary that you got through. If you wouldn't have gotten through it it would have been OK. We're not going to compare your class to any other class.) I'm not concerned about being compared with anybody. It

doesn't matter. What does matter though is covering all that material in two weeks. For some of the kids who are ready for fractions, going that fast may have got them confused. Whereas, if I could have taken another week, my three week presentation, that would have been right in step with where they would normally be. It would have been very beneficial to them. (We would have been more than happy to have had more than three weeks but I don't think most of the teachers would have agreed to that.) We've had good parent comments on some of the things. They were amazed at things that their children were doing. So wait til conference. I'll tell them it was just an experiment we were trying out and the kid is really doing multiplication now that it is all over. It ought to be a real riot. The parent response has been good. (That was one concern because we didn't send out a parent permission letter or least a letter explaining what was going on, but apparently the administration felt that that was no big problem.) I had some homework where I felt that the kids didn't have time to do it. I would let the kids hand it in if they got it done, if they didn't they were allowed to keep it over night. I knew that it probably goes home and they would do it at home. I enjoy doing that sometimes because the parents are aware what their kids are doing. I was here one night and there evidently was a mother's club or a scout meeting or something here at school and a couple of the parents stopped me and talked to me and from their

comments they were pleased. I didn't get any negative comments. I'm not sure that a cover letter needed to go home. (Well, it is generally good PR but in this case the time was so short that was involved that I don't know.) I think if you send a letter home, the whole thing gets blown out of proportion. I think your results are going to probably be more valid this way.

Was the planning you did for this topic different from planning you usually do?

No. Again, I see math as being a bunch of steps; small steps. And I saw the unit on fractions as being just a series of events; one after another that would happen before they got to activity E. What I do is try to structure it so that we could get there in 10 classes. That's about the extent to the planning; structuring when these events were going to take place.

Did you follow the materials closely, or did you improvise?

I did a lot of improvising. I didn't care for the little student booklet at all. I did look at it though and tried to correlate my activities with the activities in there so that say, by the fourth activity, that I would do according to the materials, was similar to what I had come up with. The format I guess is what I was getting at.

Are the materials you used for this topic similar to the materials you usually have available?

The stuff that I use is supplemental material that I use to

supplement textbooks. Usually what I do is try to go through the textbook and if I have problems then I fall back on these supplemental things.

Do you usually have a lot of manipulatives on hand?

No. Our whole school is not set up that way. As I look at what goes on all the way up through, I don't see a lot of that being done, I tried it here and the kids looked at me like "what are you doing?" They found it very confusing using manipulatives and I got the impression this is the first time they've ever done that type of thing. I would think that a program, if it is going to be based on the use of manipulatives, would be started in the first-grade and go all the way up through. It seems almost like a foreign thing to some of them. (That's the one thing especially at the earlier grades that the DMP materials stress very very heavily. In fact, it is a lot more heavy than it is in this. It's almost totally concrete at the first-grade level. So if you follow the DMP program, it is very very concrete up until fourth- fifth- sixth-grades. Then it starts getting more symbolic in nature. But before that it's very very concrete. There are a lot of manipulatives; almost totally manipulatives.) My lesson number one is a lot different from the other nine lessons, if you will, because I tried to use some of these things and tried to use pictures and so on and so forth and the kids (got really confused), yes. So I quickly abandoned that. I figure I've only

got nine left.

Are there any comments you would like to make except the fact that you said you didn't like the materials particularly?

Well it's the format. Again, I keep getting back to that and that was my biggest hang-up. Usually what I did I knew where I had to get. I started out with teaching one particular skill and then I would collect the papers and check them to see how well they did. How well they did dictated to me what I would do next. So as far as long term planning it was just looking at where I was starting and where I had to go in nine days. But in between there it depended upon how well the kids latched on to something. I would say there was probably three or four that after the second day I had concerns about. I tried to get along that sequence the best I could or as fast as I could. I think I'll probably with some of the kids continue with this -- I got them going and they're going to have to go through fractions anyway. I think I've got a good start with a lot of the kids. I hate to have to stop now; go back and review this and review that and then have to go wade through this again. (Well, for some of them probably they've reviewed quite a bit of their multiplication and division in the mean time with these fractions that we've been working with.) Some of the weak areas I can go back and spend more time. I'm glad it's over, the pressure (Did you feel the pressure?) Oh, yes. (By pressure, what kind of pressure?)

Pressure to be there in nine more lessons; to be there at
eight more lessons; to be in seven more - (You didn't feel
particularly any pressure from being in the classroom,
did you?) No. He doesn't talk much.

INTERVIEW - TEACHER 7

How many years teaching experience do you have?

This is my 13th year.

Is this the topic you usually teach at this time?

No. This is much later in the year.

What do you usually teach right now?

I usually teach addition, subtraction and multiplication. I usually start with addition/subtraction and work into multiplication. Many of them by this time of the year have not, I don't feel had a good enough grasp of general multiplication facts to get into working fractions.

You probably don't think this topic was appropriate to teach at this time.

At this time, no.

When do you usually teach fractions?

I would usually start somewhere in late October or early November, Get all the way through addition and subtraction, multiplication, division; spend quite a lengthy time on fractions.

Did you feel comfortable teaching this topic?

No, I found I had a lot of difficulty with it and one thing, I don't think a lot of them were ready for it and this led to difficulty. I, too, had difficulty working with the whole group, and eventually I did split them down because I found that some just could not go on and others I felt were very impatient --

waiting -- so I did split them into two groups and then things worked more smoothly for me.

Do you think your students were well prepared for this topic?

Some were, others definitely not.

Do you think two weeks is enough time for this topic?

Definitely not. I couldn't come near completing it.

What activity did you get through?

Well, once I split I got up through activity E with the advanced group and with the lower group activity C.

Was the planning you did for this topic different from the planning you usually do?

I think that I probably spent a little more time -- some of it was due to the approach which I think was a little different, and having taught the other text for many many years I probably didn't have as much planning as I did with this. I felt things moved too rapidly. There wasn't enough drill and I had to make some up, so I think it took a little more time. (That's something we've found with almost every teacher we've talked with that there was not enough drill.) It's like in the addition -- you get into addition and subtraction -- we'll make that two problems with common denominators and on the third problem they're right into different numerator/denominators. I think they need more repetition and drill on it before going on to something else.

Did you follow the materials closely?

Yes.

You did do some improvising?

In the beginning I went back into a general review of what fractions were. Many of them had no idea even what a fraction meant let alone in the first lesson finding equivalent fractions, so I spent a couple of days in the beginning drawing fractions; talking about fractions; talking about the numerator/denominator; what each meant and other than that, once I got the general introduction to fractions then I followed the book very closely.

Are the materials you used for this topic similar to those you usually have available?

No. Normally what we use here is Laidlaw; it's not their newest edition, but we've used Laidlaw ever since I've been in this system. (Does that have a lot of manipulatives?) No. It's basically a text book although I have available fraction discs and a few of these things that I have used.

Do you feel that the information about your students that you were given at the beginning was useful to you?

I used it in the beginning when I set up the heterogeneous grouping, but as I split I found that took all of those who liked math and those who did well were more or less in one group and the others in the other group. If you like something you're good at it; that's what I found. As far as getting into the games, I like the games at the end. I think they would be great, but we didn't get far

enough into this for them to be used. We used them the last couple of days and I made one up -- I called it 50 points win -- I used the number dice and the letter dice and I'd shake it -- I hit in column A one of the different skills we progressed proving that the different kinds and they were playing that -- I made a mistake and I should have added a sixth row because there are six numbers on a dice but when we shook a six they lost points. They didn't really get into the games because we hadn't gone far enough.

Do you feel the motivational strategies were useful to you?

Yes, I agree with them -- the heterogeneous grouping I think is good and the game situation is definitely good -- they can have some fun doing it, but we didn't get really far enough into it. My biggest problem was that they just moved too rapidly for many of the students.

Do you have any comments?

I guess nothing other than what I've said.

INTERVIEW - TEACHER 8

How many years teaching experience do you have?

17

Is this the topic you usually teach at this time?

No

What do you usually teach?

Normally a lot of number systems. Reading the difference between 10's, 100's 1000's. A lot of set work. A lot of basic addition and subtraction work. Depending on at this point already I would have normally broken the class into two or three groups just on the combination of ability. Achievement groups already.

Do you think this topic was appropriate to teach at this time?

No

When would you teach fractions at the fifth grade level?

Well, I'm following Laidlaw '72 edition which traditionally places most of this timewise--the capable students would hit that about November 1st. The slower fifth grade level youngster perhaps as late as March 1st. However, before I go into fractions I spend a lot of time on common factors and common multiples so that they can add and subtract unlike fractions easily; so they can reduce fractions, so they can change fractions to common denominators to compare. I'll spend as much as a week on it; at least a week on both topics. The book covers it in a day, but at least a week on the book.

Did you feel comfortable teaching this topic?

No. (Why not?) Except one youngster who could do all of this in his head, it was too difficult conceptually for the children. Now the book also had suggested we get into arrays with the children which was too difficult to understand in the sense that it was all a visual, a manipulative or visual hand pencil on drawings skill. I tried to use the cm cubes with the children and that was kind of confusing so we switched to the cuissenaire rods. As a matter of fact we worked with them extensively the first week; I guess for two days just on making a whole equal thirds, making a whole equal fourths. Then we began to get a larger whole and put thirds and fourths next to it. For some reason other than the different colors with the cm blocks they had to do a lot of grouping using the cm cubes if you had a whole equal to 12 equal parts--each third would be four pieces. With the cuissenaire rods, they would just take a light colored green or whatever it was and they didn't have individual rods to work with. So we spent a lot of time on that. Matter of fact I've got one who is just a few points above being an MR student. is able to hang onto this stuff and do it using the cuissenaire rods. At this point

knows no division skills in terms of 12 divided by 3. He just doesn't know that. He was able to write $2/3$ is equal to whatever 12ths using his cuissenaire rods and he was equal to probably

half to two-thirds of the class just in raw numbers, keeping pace with them if not a little bit ahead of them. That surprised me because I had worked with all last year, and apparently, I think what happened is if I had done a lot of work with the cuissenaire rods we're on his concrete conceptual level. He doesn't function well in the abstract. So for him it was a success. What he will do on this test, I don't know because it's all paper and pencil. Already last Wednesday I had to move one youngster ahead because he just had those skills--he was able to function abstractly and also for the self so to speak. Then on Monday of last week I added another youngster to his group of one so then I had a group of two. By the time Thursday came, I really was in the process of beginning to break the remainder of the class into another pair of groups. Simply, at this point where they were was too different to have them working together. On topic 71A, I moved into that thinking they could handle it and the first day was basically a disaster. It was frustrating for the children so then we moved backwards and just did a lot of talking. I guess we spent a day and a half just working with the cuissenaire rods doing no pencil and paper work. We did do topic B and subsequently skipped topic C because that was adding and subtracting of like fractions and subsequently unlike fractions. I had skipped that part because I felt that unlike fractions right away was just too difficult a concept for the children to handle, so we went simply into talking about mixed

fractions. I had some good success with that. I'm going to follow up with that on Tuesday; tomorrow and Wednesday; just continue to talk about the mixed fractions to in a sense finish the continuity of it and then we'll go back to my Laidlaw program.

Do you think your students were well prepared for this topic?

Basically no. There was one youngster who could handle it, basically, A-E were review for him. Five of the other children had some of these things last Spring, they just needed considerably more review than the book had assumed they had.

What activity did you get through with most of the kids then?

Basically finished A. At that point already my achievement levels were different. I believe I finished A with all of the children. B, I've got a group of 10 who weren't finished yet with B. I actually have a group of five who had completed B. Two youngsters who were up in E or someplace.

You probably don't think that two weeks is enough time for this topic.

No. Not for an average class, although this again is at the beginning of the year. If this was built on another topic--I don't know what concepts--that might have altered this. A lot of the earlier topics are now being revised for the younger grades 1 through so forth and so on because of teacher suggestions. They didn't like the way some things were written and when they were designed; all the topics were generally designed around a two week - 10 day kind of thing with alternatives built in. After it's been

out in the schools now for quite some time we've gotten a lot of feedback from teachers about it and so a lot of it is being re-written now, and what influence that will have on some of the later stuff I don't know.) Even if my children might have had the background of Topic 67, I don't think I could have finished this in two weeks. (We didn't expect you to at all. E is generally considered the cut off point. Anything past E is kind of optional and so if you get through E they consider that to be the fundamentals and that's considered to be OK as far as the topic is concerned. And two weeks even for E is a short period of time for most kids.)

Did you plan any differently for this than you usually do for your math?

Not substantially. I had expected more hands on things right away and in the topic 71A I was frankly if I would have had a choice, I would not, I don't think, at the moment purchase DMP. Inconsistency is what I feel. Again this is based on what I know and what I'm working with. (You have indicated before that you have improvised considerably and you felt that was because a lot of the children were not able to handle what was in the book.) Well, the 71A, the first three topics has the children working with arrays and B suggests they get into the cm cubes. My children were not able to work with the arrays. That was one of the changes. Another problem I've got is on for example workbook page 2 the youngsters are working with a third and a sixth, a fourth and an eighth, a

third and twelfth then all of a sudden the book flip flops to a sixteenth and a fourth, tenth and a fifth, an eighth and a half. I guess I feel in a sense the way the book is set up there is not enough internal practice before they begin to flip flop things. I know as a youngster gets on later, he should be able to handle the larger denominator equaling two of the smaller denominators whatever for example a fourth equals two eighths. But I think that switches demand of the children too quickly and I found that again on page 2. The book gave the children a couple impossible problems--they have no problem except for some of my children who have difficulty understanding think every problem is impossible. So I think one which is designed with no possible answer--I felt these were just thrown in there too quickly for the kids.

Are the materials you used for this topic similar to those materials you usually have available?

We had two things--we had the pupil topic 71 booklet and the other student guide book. In my dozen and a half years teaching I have just accumulated a lot of stuff. In that sense I suppose really a lot of worksheets which I have gathered are similar to what's here. The real difference is graphics. The kids noticed that immediately. The cartoon type characters. I don't --I know DMP has a lot of games built into it and different activities. I've got a batch of different games, but they are not specifically

designed for activities. Attribute games and so on.

Any comments?

None.

INTERVIEW - TEACHER 9

How many years of experience teaching have you had?

13

Is this the topic you usually teach at this time?

No.

What do you usually teach right at the beginning?

Usually, number systems and the review of addition and subtraction; review of year before and then into multiplication and division, and then, second semester, fractions.

You don't think that this topic was appropriate to teach at this time?

No, I think this material we would have done much better on next February. (So, you would have started about February?)

Did you feel comfortable teaching the topic?

Oh, sure.

Do you think your students were well prepared for this topic?

No. There were two of them that were. Two that I would have loved to teach and I almost decided to do that.

You probably didn't think then that you had enough time to teach the topic.

No, not for this group.

What activity did you get through in the book?

We went through; actually we were on the first one; still on the first one. We were learning about fractions. There was no way

we could add or subtract or get into the operations.

Was the planning you did for this topic different from the planning you usually do?

No, except that I enjoyed the games idea. I liked that because the materials were here and I didn't have to scrounge all over the school finding them. I got into more games and things, and I had more enthusiasm than I might have otherwise.

Did you follow the materials closely, or did you improvise a lot?

I followed them very closely the first week. Then I found the kids weren't getting it and they weren't able to go on in the sequence that they had intended. We were going slow; then I had to go back and we started making up materials to give practice and repetition.

So the materials, you made them more drill kinds of things?

Drill kinds of things, right.

Are the materials you use for this topic similar to those you usually have available?

No, the hands on materials like these chips and the games are not -- they're different. All I've got in regular materials is a math book ordinarily. So it's math books and what I ditto. These were much better; I like the variety. I like the idea that I could use all of the materials. It was there to back me up.

Did you feel that the information that we gave you about your students at the beginning was helpful to you?

Partly. Partly though, when it got right into it, after I worked two or three days, then I started going by what I knew about the kids. I used that the first couple of days; afterwards I didn't use it. Then I was using what I knew about the kids from my contact with them. After I got to know them, I didn't use the pretest materials.

Were the pretest results similar to what you found in your class about these kids?

I would have to check it now. As far as interest I think it was. I know in the case of the two students that really wanted to work more on this, it was.

Are there any comments you would like to make?

I was saying before that if we hadn't been an experiment I would have quit with this group -- working as a group -- because their personalities are so different. There are such basic things that they're in conflict a lot and I have come to know that these kids really need to work individually. I will probably put curtains around them, or something like that to give them peace, so that they will be working one-on-one with me and things like that and they won't be meeting in groups. If I had known it sooner, I would have planned my lessons that way, but I planned the lessons and I just didn't realize that it wasn't going to work.

Didn't you feel the materials you had were flexible enough so that you could individualize with them?

I might have been able to except that they didn't have the skills either. So here I had to instruct and they had to listen and it was too far. I'm sure that some of them are at maybe the second and third grade level. If I was using the whole kit, those guys would be in another place instead of just his one part where they were all at the same level. I like the materials and I wish I had a group that could have used them. But I didn't know that when I started.

GENERAL DESCRIPTIONS OF CLASSES

Class 1 - At the beginning of class students are sitting in rows. The teacher who is at the front, talks quite a lot and does many examples on the board and overhead projector. Class grouping is traditional with students remaining seated at their own desks. The general format of the class is 10-20 minutes of teacher lecture and/or explanation of problems; then the remainder of the period consists of teacher moving about the room answering questions of individuals. Students are free to converse with each other about problems, but student movement is minimal. Talking usually occurs between neighbors in close proximity. Teacher lectures are innovative with many visual aids used. All student work, however, was paper and pencil. There was no use of manipulatives.

Class 2 - The class started in a very traditional manner with students sitting in rows in assigned seats. As the week progressed, a small group of approximately seven students (size fluctuated) splintered off from the large group and sat around a table in a corner of the room near the blackboard. After the beginning lecture (consisting of questions and explanations) was completed, the large group usually worked individually on the assignment and the small group worked together. The teacher generally answered questions individually in the large group. However, the teacher spent most time talking with the small group in following up the same or

previous day's lesson. Most student work was paper and pencil with some time given to playing a DMP game. There was very little student movement, yet students are allowed to converse with each other.

Class 3 - The general classroom organization is that of neat rows. However, students do occasionally shift in seating arrangement on teacher direction in order to organize into smaller groups. The teacher talks at the beginning of period, generally explaining and working examples. Smaller groups then work on assignment. Generally, groups work independently. The teacher moves around the classroom answering individual questions. Even in smaller groups, students will often work independently. The teacher will often take a small group to the board and give extra help. Most student work is paper and pencil with some games being played. There is little student movement and student-student conversation is minimal.

Class 4 - The class setting is such that all students are assigned to small groups (6-7) sitting around tables. The format of the class varies. Most of the time the teacher reviews what was done the day before and then explains the new lesson. Individual problems are sometimes given and small groups are asked to solve the problems together. Answers are then shared with the large group. Often, small groups will work on assignments together.

The teacher uses a wide variety of teacher aids in his presentation. Students use manipulatives heavily in their work. Games are used extensively for both filler items as well as content activities directly related to the day's lesson. Considerable student movement and student-student conversation can be observed. The teacher circulates, continually answering questions as well as participating in progressing activities.

Class 5 - Students are usually seated in rows. The teacher generally lectures at the beginning of the period for approximately 10-15 minutes. Most of the time, students are listening to the teacher's lecture which often may be aimed only at certain members of the group. Lectures seem to be well organized. After the lecture, students usually work individually. However, considerable student movement as well as student-student conversation is evident. Most student-student conversation is between students who are sitting close to each other. Later in the week two students are split off to form a small group working together in the back of the room. There is considerable teacher movement during student work periods. The teacher circulates around the class answering questions as they arise. There is some use of manipulatives by students, but it is obvious that some students don't need to use manipulatives at all. The teacher generally has activities prepared for those students who finish the activity they are working on.

Class 6 - When one walks into this class, one is immediately struck by its informal nature. Although the time for the class to begin is set, the actual starting time is flexible. Students trickle in continually until all are there. Student desks are arranged not in rows, but are situated around the sides of the room such that students, when seated in their desks, are facing the wall. Considerable time is spent at the beginning of the period 'lecturing' to the large group. Lecturing in this class is not lecturing in the usual sense of the word. The teacher talks minimally. Problems to be solved are presented on the board one at a time and individual students volunteer or are asked to solve either the whole problem or certain parts of it at the board. Student participation in the procedure is enthusiastic. After a certain number of problems have been presented and solved in this fashion, the teacher usually hands out a worksheet or two which has similar problems. Students then work individually on the sheets and when finished, check their answers against a key which has been prepared. The teacher circulates, answering questions and monitoring progress. Students who finish quickly are often asked to help other students who are having difficulty. As the class starts, so does it end. Students trickle out as they trickled in. It is the last period of the day.) No manipulatives or games are used.

Class 7 - The class begins with students seated in rows.

However, after the teacher's topic introduction, students at beginning of the first week split into small groups. At the end of the second week, only two groups were still functioning. The format of the class would generally consist of the teacher talking with one group at the back of the room for approximately half the period and then giving the assignment to that group to work on individually. The last half of the period is spent talking to the second group, with a brief period at the end of class where all students are working individually. During this time, the teacher circulates answering questions. Often members of the second group spend the first half of class working on something other than math. Student movement and student-student conversation is allowed and is considerable. Games were used a small percentage of time. No other manipulatives were used.

Class 8 - As one walks into the classroom, one is immediately impressed by the cluttered atmosphere. Paper and school supplies are everywhere. Students sit in pairs throughout the classroom. Math class begins with the teacher talking to the whole group. Sometimes the group is brought to the front of the room where the teacher explains a concept using manipulatives, around a table where all students are gathered. Other times the teacher talks to the whole group while sitting at their desks. Students are then often

asked to work individually on a set of problems while the teacher circulates. There is very little student movement. Student-student conversation is evident, however, strict adherence to teacher wishes is required. All children used manipulatives and games were used toward the end of the two weeks.

Class 9 - This class was a split grade in which approximately half the class was fourth grade and half was fifth. During the time math class for fifth was in session, fourth grade worked on other things without the assistance of the teacher. As one might well imagine, this situation produced difficulties. The class format was irregular in that at the beginning of the two weeks teacher lecturing to the whole class was evident at the beginning of the math period. As the two weeks progressed, less time was spent in this fashion and more was spent working without the benefit of any introduction. It became harder and harder to pinpoint the actual starting time when students began working on math. Class organization was not fixed and student movement was constant. Student discipline was not good and considerable teacher time was taken in correcting student behavior. Some manipulatives as well as games were used. Since class originally started with nine members and finished with seven (two girls were taken out of class during the first week of the study), a small group atmosphere was prevelant. In general, the class was disorganized and individual members seemed unsure about their particular tasks.

APPENDIX I

Median Split Procedures for Selecting
Students for Observation

MEDIAN SPLIT PROCEDURE FOR OBTAINING TARGET STUDENTS

This procedure was used to obtain the eight target students which were observed in each class.

Steps in Procedure:

1. Within each class, each student's preinstructional attitude, mathematics competency and mathematics problem solving scores were transformed to z-scores.
2. An overall prior achievement z-score for each student was obtained by finding the average of each student's mathematics competency and problem solving ability z-scores.
3. Medians for prior achievement and preinstructional attitude, based on z-scores, were determined for each class. Medians are shown in Table A.
4. Each student within each class was then placed into one of the four quadrants shown in Figure A based on his/her prior achievement and attitude scores, in relation to the class medians for those aptitudes. For example, a student would be placed in quadrant I if both his/her achievement and attitude scores were above the respective class medians for those aptitudes.
5. After all students in each class had been placed into the appropriate quadrants, the two students in each quadrant who were farthest from both medians were chosen as those students to be observed.

Table B shows the number of students in each class which were placed in each quadrant.



Table A
Class Medians* for Preinstructional Attitude
and Prior Achievement

Class	Attitude	Achievement
1	.032	-.065
2	-.154	.088
3	-.082	-.186
4	.227	.087
5	-.150	.023
6	-.137	-.011
7	.313	.007
8	-.114	-.058
9	.047	-.101

*All medians are in terms of z-scores.

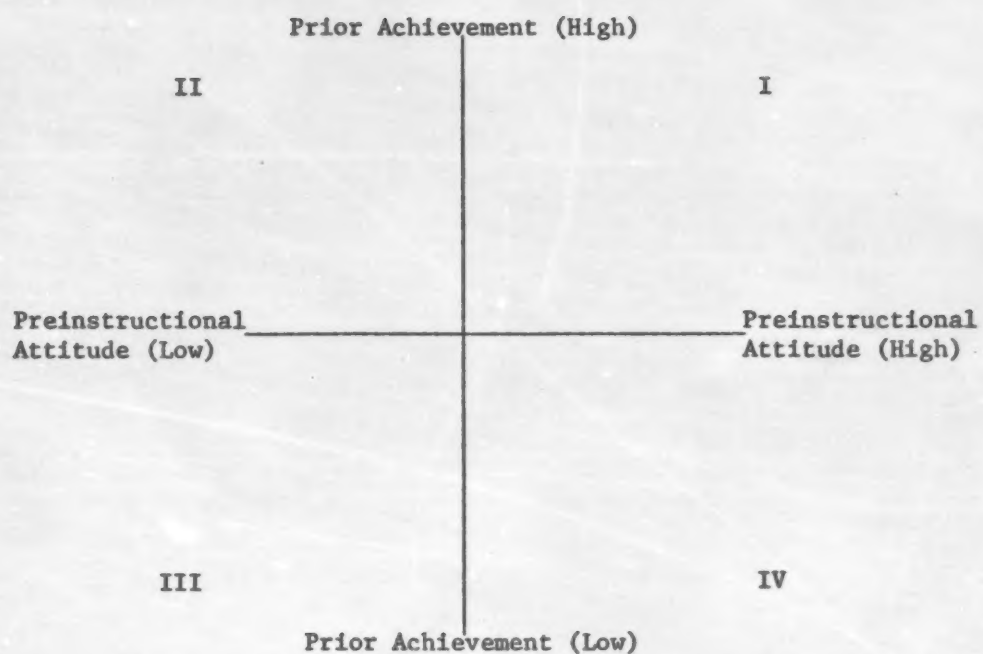


Figure A: Schematic representation of four preinstructional aptitude quadrants.

Table B
Number of Students in Each Quadrant
for Each Class*

Class	Quadrant			
	I	II	III	IV
1	10	2	2	10
2	8	8	8	8
3	4	6	5	4
4	7	5	5	7
5	3	5	6	3
6	5	8	7	5
7	7	3	4	6
8	2	5	5	3
9	3	2	1	3

*Only those students with scores for all three aptitude measures are included.

APPENDIX J**Supplementary Analyses and Tables**

1. ANOVA'S for Motivation Strategy Use
(Including Planned & Posthoc Comparisons
for Small Group Use)
2. ANCOVA for Postachievement
(Including Classes 4 & 9/Also Planned
Comparisons for Treatment Groups)
3. Kruskal-Wallis for Lesson Plans
4. Supplementary Kendall Tau Analyses
5. Kendall Tau Analysis for Observed
Motivation Strategy Use/Engaged Time
6. Partial Correlation Analyses
7. Pooled Within Correlation Tables for
Observed Students
8. Pearson Correlation Tables for Observed
Students
9. Pearson Correlation Tables for All
Students
10. Correlations for Lesson Plan Categories
and Teacher Behavior Categories Based
on z-scores
11. Means and Standard Deviations for Observed
Pupil Behaviors by Class (Percentages)
12. Correlations Among Classes Based on Means

Table A
Nested Analysis of Variance for Use of Games/Puzzles

Source	<u>df</u>	<u>SS</u>	<u>MS</u>	η^2	<u>F</u>
Group	2	.48	.24	.24	11.32**
Teacher with- in group	6	.48	.08	.24	3.70*
Error	50	1.07	.02		
Day	9	7.63	.85	.33	81.07**
Day X group	18	7.19	.40	.31	38.23**
Day X teacher within group	54	3.95	.07	.17	6.99**
Error	450	4.70	.01		

* $p \leq .004$
 ** $p \leq .001$

Table B
Nested Analysis of Variance for Use of Competition

Source	<u>df</u>	<u>SS</u>	<u>MS</u>	η^2	<u>F</u>
Group	2	.72	.36	.26	17.99*
Teacher with- in group	6	1.08	.18	.39	9.07*
Error	50	.99	.02		
Day	9	6.53	.73	.29	69.02*
Day X group	18	5.60	.31	.25	29.60*
Day X teacher within group	54	5.35	.10	.24	9.43*
Error	450	4.73	.01		

* $p \leq .001$

Table C
Nested Analysis of Variance for Use of Small Groups

Source	<u>df</u>	<u>SS</u>	<u>MS</u>	η^2	<u>F</u>
Group	2	3.30	1.65	.37	49.75*
Teacher with- in group	6	3.97	.66	.44	20.00*
Error	50	1.66	.03		
Day	9	.95	.11	.06	8.77*
Day X group	18	1.56	.09	.09	7.20*
Day X teacher within group	54	9.06	.17	.53	13.93*
Error	450	5.42	.01		

* $p \leq .001$

Planned and Posthoc Comparisons Among Treatment Group Means

(Use of Small Groups)

$$\bar{X}_1 = .19; N = 23$$

$$\bar{X}_2 = .07; N = 17$$

$$\bar{X}_3 = .03; N = 19$$

$$t_D = 2.48$$

Planned Comparisons

$$\psi_1 = \mu_2 - \mu_3 : \text{Confidence Interval} - .11 \leq \psi_1 \leq .19$$

$$\psi_2 = \mu_1 - \mu_2 : \text{Confidence Interval} - .02 \leq \psi_2 \leq .27$$

$$\psi_3 = \mu_1 - \mu_3 : \text{Confidence Interval} - .03 \leq \psi_3 \leq .31$$

Posthoc Comparisons

$$S = \sqrt{(3-1) F_{2,56}(.95)} = 2.52$$

$$\psi_4 = \mu_1 - \frac{1}{2}(\mu_2 + \mu_3) : \text{Confidence Interval} - .02 \leq \psi_4 \leq .27$$

Table D

Nested Analysis of Variance for Total Motivation Strategy Use

Source	<u>df</u>	<u>SS</u>	<u>MS</u>	η^2	<u>F</u>
Group	2	9.67	4.84	.32	27.87*
Teacher with- in group	6	12.00	2.00	.40	11.52*
Error	50	8.68	.17		
Day	9	27.78	3.09	.22	40.27*
Day X group	18	26.86	1.49	.21	19.47*
Day X teacher within group	54	36.38	.67	.29	8.79*
Error	450	34.49	.08		

* $p \leq .001$

Table E
 Analysis of Covariance for Postachievement With Mathematics
 Competency and Problem Solving Ability as Covariates
 (Classes 4 and 9 Included)

Source	Adjusted <u>df</u>	Adjusted <u>SS</u>	Adjusted <u>MS</u>	η^2	<u>F</u>
Covariates	2	7765.48	3882.74	.42	70.22*
Treatments	.2	481.87	240.93	.05	4.36*
Error	183	10119.39	55.30		
Total	187	10601.26			

* $p \leq .05$

Planned Comparisons Among Treatment Group Adjusted Means

$$\bar{X}_1 = 21.07; N = 65$$

$$\bar{X}_2 = 21.45; N = 57$$

$$\bar{X}_3 = 17.86; N = 66$$

$$\psi_1 = \mu_2 - \mu_3 : \text{Confidence Interval} - .34 \leq \psi_1 \leq 6.85$$

$$\psi_2 = \mu_1 - \mu_2 : \text{Confidence Interval} - 3.65 \leq \psi_2 \leq 2.89$$

$$\psi_3 = \mu_1 - \mu_3 : \text{Confidence Interval} - .07 \leq \psi_3 \leq 6.36$$

Table F
Proportional Scores and Ranks for Analysis of Group Planning
Differences Using Kruskal-Wallis Procedure

Treatment/teacher	Score	Rank
No student information/ no motivation strategies		
Teacher 1	1.42	5
Teacher 2	1.09	8
Teacher 3	1.06	9
Total		22
Student information/ no motivation strategies		
Teacher 1	1.59	4
Teacher 2	2.07	1
Teacher 3	1.11	7
Total		12
Student information/ motivation strategies		
Teacher 1	1.72	3
Teacher 2	1.21	6
Teacher 3	1.96	2
Total		11

$$\begin{aligned}
 H &= 12/9(10)[(22^2 + 12^2 + 11^2)/3] - 3(10) \\
 &= 3.29 \text{ (non-significant since } \chi^2_{2; .95} = 5.99)
 \end{aligned}$$

Table G

Kendall Tau Values for Each Class Between Variables Motivation
Strategy Use and Teacher Planning, Observed Clarity and
Teacher Planning, and Observed Clarity and Engaged Time

Variables	Class								
	1	2	3	4	5	6	7	8	9
Motivation use/planning	-.45	.19	.37	.28	.54	-.30	.02	.07	.04
Observed clarity/planning	-.12	.07	-.16	-.05	-.04	.12	-.13	-.39	.26
Observed clarity/engaged time	.04	.30	-.09	.16	.34	.13	-.09	.05	.11

t - tests

Motivation/planning: $\bar{X} = .0838$; $\sigma = .3096$

$$t = \frac{\bar{X} - \mu}{\frac{\sigma}{\sqrt{N}}}$$

= .8120 (non-significant at .10 level)

Observed clarity/planning: $\bar{X} = -.0491$; $\sigma = .1855$

$$t = \frac{\bar{X} - \mu}{\frac{\sigma}{\sqrt{N}}}$$

= -.7941 (non-significant at .10 level)

Observed clarity/engaged time: $\bar{X} = .1063$; $\sigma = .1508$

$$t = \frac{\bar{X} - \mu}{\frac{\sigma}{\sqrt{N}}}$$

= 2.115 (significant at .05 level)

Partial Correlation Analyses

Student Perceived Clarity and Engaged Time (Partialing Out Observed Clarity):

$$\underline{r} = .3099$$

t - test: df = 61

$$\underline{t} = \frac{.3099 \sqrt{61}}{\sqrt{.9040}}$$

$$= 2.55 \text{ (significant at .05 level)}$$

Student Engaged Time and Postachievement (Partialing Out Competency and Problem Solving):

$$\underline{r} = \frac{.3553 - [(.2917)(.3959)]}{\sqrt{(1 - .2917^2)(1 - .3959^2)}}$$

$$= .2707$$

t - test: df = 61

$$\underline{t} = \frac{.2707 \sqrt{61}}{\sqrt{.9267}}$$

$$= 2.196 \text{ (significant at .05 level)}$$

Student Perceived Clarity and Engaged Time (Partialing Out Preinstructional Attitude):

$$\underline{r} = \frac{.1369 - [(.1632)(.2773)]}{\sqrt{(1 - .1632^2)(1 - .2773^2)}}$$

$$= .0996$$

t - test: df = 61

$$\underline{t} = \frac{.0996 \sqrt{61}}{\sqrt{.9901}}$$

= .76 (non-significant at .10 level)

Table H
 Tau Values for Engaged Time/Motivation Strategy Use
 (Observed Students^a)

Student Tau	Student Tau	Student Tau
1 -.10	22 +.30	43 +.29
2 -.10	23 +.41	44 +.15
3 -.18	24 +.32	45 +.27
4 -.21	25 -.23	46 -.54
5 -.20	26 +.23	47 -.67
6 -.20	27 -.56	48 -.21
7 -.28	28 -.22	49 -.06
8 -.38	29 -.22	50 +.03
9 -.45	30 -.15	51 -.35
10 +.47	31 -.12	52 +.40
11 -.15	32 -.29	53 -.19
12 -.04	33 +.05	54 -.50
13 +.31	34 +.13	55 +.05
14 +.11	35 +.33	56 -.05
15 +.31	36 +.29	57 +.19
16 +.10	37 +.06	58 +.36
17 -.20	38 +.09	59 +.09
18 +.10	39 -.18	60 +.41
19 -.64	40 +.12	61 -.53
20 -.54	41 +.25	62 +.45
21 -.35	42 +.58	63 +.04
		64 +.20

^aTau values for seven students could not be computed since no instances of motivation strategy use were observed for those students.

t - test: $\bar{X} = -.0253$; $\sigma = .3083$

$$\underline{t} = \frac{\bar{X} - \mu}{\frac{\sigma}{\sqrt{N}}}$$

= $-.6556$ (non-significant at .10
level)

KEY FOR TABLE I

SUMATT1	=	Preinstructional attitude toward mathematics
SUMATT2	=	Postinstructional attitude toward mathematics
SPERCLR	=	Perceived clarity (all items)
LSPERCLR	=	Perceived clarity (16 items)
COMP	=	Mathematics competency
PROBSLV	=	Problem solving ability
ENGTIME	=	Engaged time
LISTEN	=	Listening
INDIV	=	Individual grouping
SMALL	=	Small grouping
LARGE	=	Large grouping
GAME	=	Use of games/puzzles
COMPETE	=	Use of competition
SPSTACH	=	Postachievement
TOTMOT	=	Total motivation strategy use

Table I
Pooled Within Class Correlations for Observed Students

Variable	SUMATT1	SUMATT2	SPERCLR	LSPERCLR	COMP	PRBSLV
SUMATT1	1.00					
SUMATT2	.79**	1.00				
SPERCLR	.38**	.54**	1.00			
LSPERCLR	.37**	.45**	.94**	1.00		
COMP	.35**	.40**	.42**	.37**	1.00	
PRBSLV	.18	.25*	.49**	.44**	.76**	1.00
ENGTIME	.30*	.46**	.31*	.27*	.48**	.41**
LISTEN	.09	.19	.23	.21	.38**	.25*
INDIV	-.06	-.02	-.02	-.10	-.12	-.23
SMALL	.08	-.00	-.21	-.16	-.13	-.06
LARGE	-.04	.03	.26*	.26*	.27*	.26*
GAME	.21	.27*	.23	.20	.51**	.58**
COMPETE	.19	.26*	.18	.15	.47**	.54**
SPSTACH	.34**	.42**	.59**	.54**	.75**	.77**
TOTMOT	.19	.18	.00	.02	.24	.34**

* $p \leq .05$

** $p \leq .01$

Table I (continued)

VARIABLE	ENGTIME	LISTEN	INDIV	SMALL	LARGE	GAME
ENGTIME	1.00					
LISTEN	.46**	1.00				
INDIV	-.31*	-.18	1.00			
SMALL	.04	-.35**	-.55**	1.00		
LARGE	.22	.57**	-.19	-.72**	1.00	
GAME	.27*	-.16	-.16	.10	.02	1.00
COMPETE	.25*	-.19	-.15	.12	-.01	.99**
SPSTACH	.52**	.33**	-.25*	-.11	.34**	.51**
TOTMOT	.20	-.35**	-.47**	.74**	-.47**	.74**

* $p \leq .05$
 ** $p \leq .01$

Table I (continued)

Variable	COMPETE	SPSTACH	TOTMOT
COMPETE	1.00		
SPSTACH	.48**	1.00	
TOTMOT	.76**	.26*	1.00

* $p < .05$

** $p < .01$

KEY FOR TABLE J

COMP	= Mathematics competency
PLNSCR	= Raw planning score
PPLNSCR	= Proportional planning score
OBSCLR	= Observed clarity
SUMATT1	= Preinstructional attitude
SUMATT2	= Postinstructional attitude
SPERCLF	= Perceived clarity (all items)
LSPERCLR	= Perceived clarity (16 items)
OUTLNS	= Outlines objectives
EXPLNS	= Explains what to do next
REVSM	= Reviews/summarizes
RLTS	= Relates content
REPQE	= Repeats questions/explanation
EMPHIP	= Emphasizes important points
OTHER	= Other
ENG	= Mean class engagement
OFTSK	= Mean class off-task
LSN	= Mean class listening
IND	= Mean class individual grouping
SML	= Mean class small grouping
LRG	= Mean class large grouping
GAM	= Mean class games use
COMET	= Mean class competition

KEY FOR TABLE J (continued)

OBJLG	= Objectives (large)
OBJSM	= Objectives (small)
CONLG	= Content (large)
CONSM	= Content (small)
ACTLG	= Activities (large)
ACTSM	= Activities (small)
INSLG	= Instruction (large)
INSSM	= Instruction (small)
ORG	= Organization
MATLG	= Materials (large)
MATSM	= Materials (small)
DIAGLG	= Diagnosis (large)
DIAGSM	= Diagnosis (small)
EVALLG	= Evaluation (large)
EVALSM	= Evaluation (small)
ALTNLG	= Alternative procedure (large)
ALTNSM	= Alternative procedure (small)
SPSTACH	= Postachievement
TOTMOT	= Motivation strategy use
PCTSML	= Percent individual/small grouping planning statements
PRBSLV	= Problem solving ability

KEY FOR TABLE J (continued)

ENGTIME = Observed student engaged time
LISTEN = Observed student listening
INDIV = Observed student individual grouping
SMALL = Observed student small grouping
LARGE = Observed student large grouping
GAME = Observed student use of games
COMPETE = Observed student competition

Table J

Pearson Correlations for Observed Students

SPSS BATCH SYSTEM

FILE MONAME (CREATION DATE = 03/31/80)

SUBFILE CLA1 CLA2 CLA3 CLA4 CLA5 CLA6 CLA7 CLA8 CLA9

----- PEARSON CORRELATION COEFFICIENTS -----										
	COMP	PLNSCR	PPLNSCR	ORSCLR	SUMATT1	SUMATT2	SPERCLR	LSPERCLR	OUTLMS	EXPLMS
COMP	1.0000 I .711 P .000	.0235 I .711 P .423	.0510 I .711 P .336	.0274 I .711 P .410	.3317 I .711 P .002	.3420 I .711 P .002	.4306 I .711 P .000	.4064 I .711 P .000	.1566 I .711 P .000	.0200 I .711 P .434
PLNSCR		1.0000 I .711 P .423	.9671 I .711 P .000	.2617 I .711 P .014	.0401 I .711 P .345	-.0365 I .711 P .301	.0530 I .711 P .320	.0154 I .711 P .449	.1430 I .711 P .110	-.1460 I .711 P .112
PPLNSCR			1.0000 I .711 P .336	.2505 I .711 P .010	.0940 I .711 P .210	-.0004 I .711 P .499	.0724 I .711 P .274	.0213 I .711 P .430	.1433 I .711 P .117	-.1900 I .711 P .055
ORSCLR				1.0000 I .711 P .410	.0940 I .711 P .210	-.0937 I .711 P .071	-.2710 I .711 P .071	-.1109 I .711 P .160	.0374 I .711 P .000	.1500 I .711 P .000
SUMATT1					1.0000 I .711 P .002	.7614 I .711 P .000	.2970 I .711 P .000	.2909 I .711 P .007	.1150 I .711 P .160	.0377 I .711 P .370
SUMATT2						1.0000 I .711 P .000	.4791 I .711 P .000	.3004 I .711 P .000	-.0070 I .711 P .209	-.0904 I .711 P .007
SPERCLR							1.0000 I .711 P .000	.9250 I .711 P .000	-.0943 I .711 P .217	-.2219 I .711 P .020
LSPERCLR								1.0000 I .711 P .000	-.0273 I .711 P .411	-.0073 I .711 P .234
OUTLMS									1.0000 I .711 P .000	.7001 I .711 P .000
EXPLMS										1.0000 I .711 P .000
REVSX										

(COEFFICIENT / (CASES) / SIGNIFICANCE)

A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED

Table J (continued)

SPSS BATCH SYSTEM

FILE MONAME (CREATION DATE = 03/31/89)
SUBFILE CLAS1 CLAS2 CLAS3 CLAS4 CLAS5 CLAS6 CLAS7 CLAS8 CLAS9

	CORRELATION COEFFICIENTS									
	COMP	PLNSCR	PPLNSCR	UNSCRL	SUNATT1	SUNATT2	SPENCLR	LSPENCLR	OUTLNS	EXPLNS
ALTS	-.0041 I 711 P=.200	-.3502 I 711 P=.001	-.3001 I 711 P=.000	.0896 I 711 P=.000	.0367 I 711 P=.301	-.0905 I 711 P=.207	-.3409 I 711 P=.002	-.1020 I 711 P=.044	.4100 I 711 P=.004	.6730 I 711 P=.000
NEPGE	-.0073 I 711 P=.210	-.1213 I 711 P=.157	-.0604 I 711 P=.314	.4710 I 711 P=.000	.0042 I 711 P=.343	.0004 I 711 P=.253	-.2603 I 711 P=.014	-.1607 I 711 P=.080	-.1639 I 711 P=.100	.0414 I 711 P=.366
EMPHIP	.0023 I 711 P=.014	-.1020 I 711 P=.008	.0527 I 711 P=.331	.1347 I 711 P=.131	.1990 I 711 P=.040	.0902 I 711 P=.227	.0716 I 711 P=.276	.0405 I 711 P=.344	.2566 I 711 P=.001	.0477 I 711 P=.346
OTHER	-.0202 I 711 P=.017	.0002 I 711 P=.043	.2473 I 711 P=.010	-.0313 I 711 P=.000	-.0302 I 711 P=.376	.1276 I 711 P=.146	.2609 I 711 P=.012	.1031 I 711 P=.106	-.0996 I 711 P=.000	-.9437 I 711 P=.000
ENS	.1001 I 711 P=.100	.0070 I 711 P=.474	-.0005 I 711 P=.252	.0434 I 711 P=.000	-.0728 I 711 P=.273	-.1736 I 711 P=.074	-.1021 I 711 P=.109	.0043 I 711 P=.326	.4726 I 711 P=.011	.3070 I 711 P=.000
OPTAN	-.1320 I 711 P=.136	-.0469 I 711 P=.349	.0307 I 711 P=.104	-.0301 I 711 P=.000	.0669 I 711 P=.200	.1747 I 711 P=.073	.0005 I 711 P=.282	-.0005 I 711 P=.286	-.4720 I 711 P=.011	-.3649 I 711 P=.001
LION	.0023 I 711 P=.245	-.0201 I 711 P=.000	-.0937 I 711 P=.000	.5092 I 711 P=.000	-.0010 I 711 P=.497	-.1426 I 711 P=.110	-.1964 I 711 P=.056	-.0024 I 711 P=.333	.0440 I 711 P=.000	.0547 I 711 P=.000
INC	.0900 I 711 P=.200	.0009 I 711 P=.000	.3047 I 711 P=.000	-.0300 I 711 P=.000	.0163 I 711 P=.446	.1312 I 711 P=.130	.2060 I 711 P=.000	.1091 I 711 P=.093	-.0164 I 711 P=.000	-.0512 I 711 P=.000
SML	-.0306 I 711 P=.304	.1756 I 711 P=.071	.0771 I 711 P=.201	.1754 I 711 P=.072	-.0514 I 711 P=.335	-.0009 I 711 P=.231	-.0427 I 711 P=.362	-.0142 I 711 P=.463	.4001 I 711 P=.016	.6107 I 711 P=.000
ENO	-.0096 I 711 P=.220	-.0042 I 711 P=.000	-.0509 I 711 P=.000	.5000 I 711 P=.000	.0250 I 711 P=.415	-.0063 I 711 P=.240	-.3100 I 711 P=.003	-.1050 I 711 P=.060	.4103 I 711 P=.000	.0030 I 711 P=.000
GAM	-.0009 I 711 P=.261	-.0371 I 711 P=.210	-.0932 I 711 P=.220	.1203 I 711 P=.150	-.0294 I 711 P=.404	.0134 I 711 P=.450	-.0352 I 711 P=.305	-.0104 I 711 P=.464	.4627 I 711 P=.001	.6071 I 711 P=.000

(COEFFICIENT / (CASES) / SIGNIFICANCE)

(A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)

Table J (continued)

SPSS BATCH SYSTEM

FILE RUNAME (CORRELATION DATE = 03/31/68)

SUBFILE	CLAS1	CLAS2	CLAS3	CLAS4	CLAS5	CLAS6	CLAS7	CLAS8	CLAS9	
----- PEARSON CORRELATION COEFFICIENTS -----										
	CUMPL	PLNLSCH	PPLNSCH	UJLSCL	SUNAT71	SUNAT72	SPINCLN	LSPINCLN	QUILNS	EXPLNS
COMET	-.0727 t 711 P=.273	-.0679 t 711 P=.407	-.1740 t 711 P=.073	.0690 t 711 P=.284	-.0945 t 711 P=.217	-.0514 t 711 P=.335	-.0165 t 711 P=.444	.0185 t 711 P=.439	.2106 t 711 P=.003	.5990 t 711 P=.000
GUJLG	-.0347 t 711 P=.387	.1433 t 711 P=.117	.1895 t 711 P=.057	.5931 t 711 P=.000	.0525 t 711 P=.332	-.0087 t 711 P=.284	-.1471 t 711 P=.110	-.0472 t 711 P=.346	.4440 t 711 P=.020	.1580 t 711 P=.093
GUJSH	.0143 t 711 P=.453	.0915 t 711 P=.000	.0811 t 711 P=.000	.0654 t 711 P=.294	.0326 t 711 P=.394	-.0159 t 711 P=.448	.0091 t 711 P=.470	-.0471 t 711 P=.340	.4391 t 711 P=.022	-.1603 t 711 P=.051
CONLG	-.1437 t 711 P=.114	-.4047 t 711 P=.000	-.0647 t 711 P=.000	.0749 t 711 P=.000	-.1560 t 711 P=.007	.0164 t 711 P=.444	.1245 t 711 P=.150	.0470 t 711 P=.209	-.7090 t 711 P=.000	-.6448 t 711 P=.000
CONSH	.0373 t 711 P=.370	.3086 t 711 P=.000	.4248 t 711 P=.000	-.4110 t 711 P=.000	.0590 t 711 P=.315	.0172 t 711 P=.443	.1242 t 711 P=.151	-.0016 t 711 P=.496	-.4092 t 711 P=.001	-.6434 t 711 P=.000
ACTLG	-.1401 t 711 P=.144	-.7353 t 711 P=.000	-.7643 t 711 P=.000	-.2124 t 711 P=.037	-.0503 t 711 P=.315	.0719 t 711 P=.274	-.0050 t 711 P=.230	-.0020 t 711 P=.301	.0206 t 711 P=.404	.3712 t 711 P=.001
ACTSH	.0244 t 711 P=.414	.0639 t 711 P=.000	.0405 t 711 P=.000	.0061 t 711 P=.230	.0404 t 711 P=.369	-.0009 t 711 P=.471	.0006 t 711 P=.207	.0302 t 711 P=.401	.0036 t 711 P=.400	-.2510 t 711 P=.017
INSLG	.0522 t 711 P=.333	-.3462 t 711 P=.001	-.3101 t 711 P=.003	-.1932 t 711 P=.003	.0110 t 711 P=.444	-.0001 t 711 P=.233	.0295 t 711 P=.404	.0196 t 711 P=.436	-.0626 t 711 P=.209	-.2019 t 711 P=.009
INSHH	-.0194 t 711 P=.403	.0026 t 711 P=.000	.0073 t 711 P=.000	.0501 t 711 P=.239	.0200 t 711 P=.400	.0047 t 711 P=.470	.0936 t 711 P=.219	.0209 t 711 P=.309	-.1062 t 711 P=.000	-.3306 t 711 P=.002
QMG	.0041 t 711 P=.245	.4172 t 711 P=.000	.4010 t 711 P=.000	.0290 t 711 P=.000	.0367 t 711 P=.381	-.0307 t 711 P=.400	-.0037 t 711 P=.244	-.0019 t 711 P=.404	.4346 t 711 P=.000	.0030 t 711 P=.000
PATLG	-.0320 t 711 P=.392	-.0970 t 711 P=.000	-.7486 t 711 P=.000	.1044 t 711 P=.000	-.0556 t 711 P=.323	.0130 t 711 P=.457	-.1444 t 711 P=.114	-.0439 t 711 P=.308	.4617 t 711 P=.014	.6049 t 711 P=.000

(COEFFICIENT / (CASES) / SIGNIFICANCE)

A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED

Table J (continued)

SPSS BATCH SYSTEM

FILE RUNAME (CREATION DATE = 03/31/80)
SUBFILE CLAS1 CLAS2 CLAS3 CLAS4 CLAS5 CLAS6 CLAS7 CLAS8 CLAS9

PEARSON CORRELATION COEFFICIENTS										
	CUMF	PLNSCH	PPLNSCH	UNSCLE	SUMATT1	SUMATT2	SPENCL	LSPENCL	OUTLNS	EXPLNS
PATSH	.0414 1 711 P=.366	.9175 1 711 P=.000	.9076 1 711 P=.000	.0562 1 711 P=.321	.0606 1 711 P=.205	.0373 1 711 P=.379	.0797 1 711 P=.254	.0011 1 711 P=.497	-.0539 1 711 P=.320	-.3160 1 711 P=.004
DIAGLO	-.2924 1 711 P=.007	.9745 1 711 P=.000	.1098 1 711 P=.101	-.1695 1 711 P=.079	-.0539 1 711 P=.320	.0661 1 711 P=.292	-.0247 1 711 P=.419	-.0435 1 711 P=.359	-.0800 1 711 P=.001	-.1005 1 711 P=.100
DIAGSH	.0110 1 711 P=.461	.0446 1 711 P=.000	.0592 1 711 P=.000	.0300 1 711 P=.374	-.0231 1 711 P=.424	-.0104 1 711 P=.639	.1703 1 711 P=.078	.1259 1 711 P=.140	-.1749 1 711 P=.072	-.3257 1 711 P=.003
EVALLO	.2223 1 711 P=.031	-.1735 1 711 P=.074	-.0502 1 711 P=.315	.2909 1 711 P=.006	.1193 1 711 P=.161	.0097 1 711 P=.460	.0266 1 711 P=.413	.0038 1 711 P=.329	.0917 1 711 P=.000	.0094 1 711 P=.000
EVALSH	.1725 1 711 P=.075	.1035 1 711 P=.101	.3127 1 711 P=.004	-.0927 1 711 P=.221	.1171 1 711 P=.105	.1304 1 711 P=.120	.1302 1 711 P=.140	.0070 1 711 P=.309	-.1034 1 711 P=.101	-.1713 1 711 P=.077
ALTNLO	.2709 1 711 P=.011	-.0709 1 711 P=.270	.1119 1 711 P=.176	-.1010 1 711 P=.199	.1004 1 711 P=.000	.1000 1 711 P=.203	.1729 1 711 P=.075	.0973 1 711 P=.210	.1404 1 711 P=.000	.0037 1 711 P=.320
ALTNSH	.0300 1 711 P=.400	.2100 1 711 P=.035	.2440 1 711 P=.020	-.0202 1 711 P=.400	-.1164 1 711 P=.107	-.0470 1 711 P=.346	.2120 1 711 P=.037	.2317 1 711 P=.026	-.1410 1 711 P=.119	-.1737 1 711 P=.074
SPSTACH	.0740 1 711 P=.000	.3305 1 711 P=.002	.4110 1 711 P=.000	-.0709 1 711 P=.254	.3100 1 711 P=.004	.3047 1 711 P=.000	.0720 1 711 P=.000	.4069 1 711 P=.000	.0000 1 711 P=.320	-.2420 1 711 P=.021
IGTHQI	.0472 1 711 P=.340	.0301 1 711 P=.376	-.0407 1 711 P=.360	.0094 1 711 P=.220	.0500 1 711 P=.337	.0073 1 711 P=.317	-.0432 1 711 P=.360	-.0140 1 711 P=.461	.0309 1 711 P=.002	.0774 1 711 P=.000
PCTSHL	.0396 1 711 P=.371	.9300 1 711 P=.000	.9200 1 711 P=.000	.0264 1 711 P=.413	.0540 1 711 P=.324	.0173 1 711 P=.443	.1062 1 711 P=.100	.0242 1 711 P=.420	-.0400 1 711 P=.300	-.3390 1 711 P=.002
PHBSLV	.7012 1 711 P=.000	.0101 1 711 P=.440	.0402 1 711 P=.351	-.1043 1 711 P=.193	.1040 1 711 P=.002	.2144 1 711 P=.036	.0113 1 711 P=.000	.4402 1 711 P=.000	.1040 1 711 P=.193	-.1170 1 711 P=.165

(COEFFICIENT / (CABAS) / SIGNIFICANCE)

(A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)

576

Table J (continued)

SPSS BATCH SYSTEM

 FILE NONAME (CREATION DATE = 03/31/80)
 SUBFILE CLA1 CLA2 CLA3 CLA4 CLA5 CLA6 CLA7 CLA8 CLA9

----- PEARSON CORRELATION COEFFICIENTS -----										
	COMP	PLNSCR	PPLNSCR	UBSCLR	SUMATT1	SUMATT2	SPENCLR	LSPENCLR	OUILNS	EXPLNS
ENOTIME	.4452 (.71) P=.000	.0204 (.71) P=.433	-.0219 (.71) P=.428	.3674 (.71) P=.001	.2030 (.71) P=.045	.2659 (.71) P=.013	.1067 (.71) P=.060	.2484 (.71) P=.018	.1626 (.71) P=.080	.2176 (.71) P=.034
LISTEN	.2077 (.71) P=.041	-.0560 (.71) P=.321	-.0470 (.71) P=.211	.0036 (.71) P=.000	.0912 (.71) P=.225	-.0240 (.71) P=.421	-.1467 (.71) P=.111	-.0048 (.71) P=.484	.0047 (.71) P=.000	.7550 (.71) P=.000
INDIV	.0282 (.71) P=.408	.2705 (.71) P=.009	.3021 (.71) P=.001	-.5066 (.71) P=.000	-.0006 (.71) P=.498	.1189 (.71) P=.162	.2485 (.71) P=.018	.0988 (.71) P=.206	-.4685 (.71) P=.000	-.7043 (.71) P=.000
SHALL	-.1039 (.71) P=.194	.1405 (.71) P=.121	.0601 (.71) P=.206	.1225 (.71) P=.154	.0144 (.71) P=.452	-.0644 (.71) P=.297	-.1491 (.71) P=.107	-.1056 (.71) P=.190	.4123 (.71) P=.038	.3963 (.71) P=.000
LARGE	.0676 (.71) P=.288	-.4513 (.71) P=.000	-.4999 (.71) P=.000	.4562 (.71) P=.000	-.0129 (.71) P=.458	-.0708 (.71) P=.279	-.1397 (.71) P=.123	-.0120 (.71) P=.461	.4273 (.71) P=.003	.6160 (.71) P=.000
SAME	.2155 (.71) P=.036	-.0601 (.71) P=.286	-.1019 (.71) P=.199	.0480 (.71) P=.345	.1171 (.71) P=.165	.2036 (.71) P=.044	.0901 (.71) P=.227	.0902 (.71) P=.227	.1894 (.71) P=.057	.3903 (.71) P=.000
COMPLETE	.1539 (.71) P=.100	-.0706 (.71) P=.257	-.1669 (.71) P=.002	.0172 (.71) P=.443	.0326 (.71) P=.394	.1236 (.71) P=.152	.0592 (.71) P=.312	.0693 (.71) P=.283	.4036 (.71) P=.044	.4483 (.71) P=.000

(COEFFICIENT / (CASES) / SIGNIFICANCE)

(A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)

Table J (continued)

SPSS BATCH SYSTEM

FILE NONAME (CREATION DATE = 03/31/88)

SUBFILE CLAS1 CLAS2 CLAS3 CLAS4 CLAS5 CLAS6 CLAS7 CLAS8 CLAS9

	PEARSON CORRELATION COEFFICIENTS									
	HEVSH	MLTS	HEPGE	LMPHP	OTHR	ENG	OPTSR	LISH	THU	SML
COMP	.0101 I 711 P=.447	-.0041 I 711 P=.298	-.0073 I 711 P=.210	.2623 I 711 P=.014	-.0252 I 711 P=.417	.1051 I 711 P=.189	-.1328 I 711 P=.134	.0033 I 711 P=.245	.0000 I 711 P=.208	-.0356 I 711 P=.384
PLNSCR	-.1793 I 711 P=.067	-.3502 I 711 P=.001	-.1213 I 711 P=.157	-.1620 I 711 P=.088	.2052 I 711 P=.043	.0078 I 711 P=.474	-.0449 I 711 P=.349	-.4291 I 711 P=.000	.0009 I 711 P=.809	.1754 I 711 P=.071
PPLNSCR	-.2064 I 711 P=.005	-.3001 I 711 P=.000	-.0004 I 711 P=.314	.0527 I 711 P=.331	.2473 I 711 P=.019	-.0005 I 711 P=.292	.0257 I 711 P=.384	-.4937 I 711 P=.000	.2047 I 711 P=.000	.0771 I 711 P=.241
OMSCLR	.6300 I 711 P=.000	.6096 I 711 P=.000	.4718 I 711 P=.000	.1347 I 711 P=.131	-.0313 I 711 P=.800	.6434 I 711 P=.000	-.6301 I 711 P=.000	.5092 I 711 P=.000	-.6398 I 711 P=.000	.1754 I 711 P=.072
SUMATT1	-.0427 I 711 P=.362	.0367 I 711 P=.381	.0042 I 711 P=.243	.1990 I 711 P=.048	-.0302 I 711 P=.376	-.0728 I 711 P=.273	.0669 I 711 P=.290	-.0010 I 711 P=.497	.1143 I 711 P=.444	-.0514 I 711 P=.335
SUMATT2	-.1041 I 711 P=.040	-.0905 I 711 P=.207	.0004 I 711 P=.253	.0902 I 711 P=.227	.1276 I 711 P=.145	-.1736 I 711 P=.074	.1747 I 711 P=.073	-.1426 I 711 P=.118	.1312 I 711 P=.134	-.0000 I 711 P=.231
SPENCLN	-.1040 I 711 P=.053	-.3409 I 711 P=.002	-.2603 I 711 P=.014	.0716 I 711 P=.274	.2689 I 711 P=.012	-.1021 I 711 P=.199	.0005 I 711 P=.252	-.1964 I 711 P=.060	.0000 I 711 P=.000	-.0427 I 711 P=.362
LSPENCLN	-.0408 I 711 P=.349	-.1020 I 711 P=.064	-.1607 I 711 P=.000	.0485 I 711 P=.344	.1031 I 711 P=.196	.0543 I 711 P=.326	-.0605 I 711 P=.205	-.0524 I 711 P=.332	.1591 I 711 P=.093	-.0142 I 711 P=.453
OUTLNS	.6141 I 711 P=.000	.3108 I 711 P=.004	-.1639 I 711 P=.100	.3065 I 711 P=.001	-.6996 I 711 P=.000	.2726 I 711 P=.011	-.2726 I 711 P=.011	.6440 I 711 P=.000	-.5166 I 711 P=.000	.2601 I 711 P=.015
EARLNS	.0046 I 711 P=.000	.5730 I 711 P=.000	.0414 I 711 P=.306	.0477 I 711 P=.346	-.0437 I 711 P=.000	.3070 I 711 P=.000	-.3629 I 711 P=.001	.0547 I 711 P=.000	-.0012 I 711 P=.000	.0107 I 711 P=.000
REVSH	1.0000 I 711 P=0.000	.6274 I 711 P=.000	-.1138 I 711 P=.172	-.1045 I 711 P=.000	-.0099 I 711 P=.000	.5627 I 711 P=.000	-.5367 I 711 P=.000	.9134 I 711 P=.000	-.0194 I 711 P=.000	.5923 I 711 P=.000

(COEFFICIENT / (CASES) / SIGNIFICANCE)

(A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)

578

Table J (continued)

SPSS MATCH SYSTEM

FILE MONAME (CREATION DATE = 03/31/88)
SUBFILE CLA1 CLA2 CLA3 CLA4 CLA5 CLA6 CLA7 CLA8 CLA9

	PEARSON CORRELATION COEFFICIENTS									
	REVSH	RLTS	REPOZ	ENPHIP	OTHER	ENO	OF19K	L19H	IND	SML
RLTS	.6374 I .711 P=.000	1.0000 I .711 P=*****	.6065 I .711 P=.000	.0256 I .711 P=.416	-.7923 I .711 P=.000	.6715 I .711 P=.000	-.6355 I .711 P=.000	.7425 I .711 P=.000	-.8677 I .711 P=.000	-.8875 I .711 P=.234
REPOZ	-.3138 I .711 P=.172	.6065 I .711 P=.000	1.0000 I .711 P=*****	.1064 I .711 P=.040	-.2295 I .711 P=.027	.3747 I .711 P=.001	-.3459 I .711 P=.002	.0346 I .711 P=.387	.0439 I .711 P=.358	-.5658 I .711 P=.000
ENPHIP	-.1065 I .711 P=.060	.0256 I .711 P=.416	.1064 I .711 P=.060	1.0000 I .711 P=*****	-.0814 I .711 P=.250	-.0815 I .711 P=.250	.0450 I .711 P=.355	.0891 I .711 P=.230	.2763 I .711 P=.010	-.3847 I .711 P=.000
OTHER	-.9099 I .711 P=.000	-.7923 I .711 P=.000	-.2295 I .711 P=.027	-.0814 I .711 P=.250	1.0000 I .711 P=*****	-.6056 I .711 P=.000	.6746 I .711 P=.000	-.9214 I .711 P=.000	.0517 I .711 P=.000	-.3514 I .711 P=.001
ENO	.5627 I .711 P=.000	.6715 I .711 P=.000	.3747 I .711 P=.001	-.0815 I .711 P=.250	-.6056 I .711 P=.000	1.0000 I .711 P=*****	-.9961 I .711 P=.000	.8759 I .711 P=.000	-.3256 I .711 P=.003	-.1085 I .711 P=.104
OF19K	-.5387 I .711 P=.000	-.6355 I .711 P=.000	-.3459 I .711 P=.002	.0450 I .711 P=.355	.9746 I .711 P=.000	-.9961 I .711 P=.000	1.0000 I .711 P=*****	-.9526 I .711 P=.000	.2838 I .711 P=.000	.1075 I .711 P=.186
L19H	.0134 I .711 P=.000	.7425 I .711 P=.000	.0346 I .711 P=.387	.0891 I .711 P=.230	-.9214 I .711 P=.000	.8759 I .711 P=.000	-.9526 I .711 P=.000	1.0000 I .711 P=*****	-.8559 I .711 P=.000	.3395 I .711 P=.002
IND	-.9194 I .711 P=.000	-.8677 I .711 P=.000	.0439 I .711 P=.358	.2763 I .711 P=.010	.0517 I .711 P=.000	-.3256 I .711 P=.003	.2838 I .711 P=.000	-.8559 I .711 P=.000	1.0000 I .711 P=*****	-.6047 I .711 P=.000
SML	.5923 I .711 P=.000	-.8875 I .711 P=.234	-.5658 I .711 P=.000	-.3747 I .711 P=.000	-.3514 I .711 P=.001	-.1085 I .711 P=.104	.1075 I .711 P=.186	.3395 I .711 P=.002	-.6047 I .711 P=.000	1.0000 I .711 P=*****
LRO	.6237 I .711 P=.000	.9099 I .711 P=.000	.4441 I .711 P=.000	-.0831 I .711 P=.430	-.7522 I .711 P=.000	.5023 I .711 P=.000	-.4497 I .711 P=.000	.7476 I .711 P=.000	-.7127 I .711 P=.000	-.1277 I .711 P=.144
GAM	.4142 I .711 P=.000	-.1894 I .711 P=.057	-.3918 I .711 P=.000	-.2074 I .711 P=.041	-.3294 I .711 P=.002	-.2944 I .711 P=.006	.3320 I .711 P=.002	.2554 I .711 P=.016	-.4717 I .711 P=.000	.6961 I .711 P=.000

(COEFFICIENT / (CASES) / SIGNIFICANCE)

A VALUE OF 99.9999 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED

Table J (continued)

SPSS BATCH SYSTEM

FILE NONAME (CREATION DATE = 03/31/99)
SUBFILE CLAI CLAI2 CLAI3 CLAI4 CLAI5 CLAI6 CLAI7 CLAI8 CLAI9

	PEARSON			CORRELATION			COEFFICIENTS					
	HEVSH	HLTS	REPOE	SNMHP	OTHER	ENG	OFISK	LISM	IND	SML		
COMET	.5524 t 711 P=.000	-.1474 t 711 P=.110	-.8308 t 711 P=.000	-.4189 t 711 P=.000	-.3534 t 711 P=.001	-.1648 t 711 P=.100	.1879 t 711 P=.060	.3673 t 711 P=.001	-.0820 t 711 P=.000	.0166 t 711 P=.000		
ODJLO	.1806 t 711 P=.158	.5466 t 711 P=.000	.6442 t 711 P=.000	.1739 t 711 P=.073	-.3485 t 711 P=.001	.6032 t 711 P=.000	-.5010 t 711 P=.000	.1364 t 711 P=.120	.0136 t 711 P=.455	-.5436 t 711 P=.000		
ODJSH	-.2109 t 711 P=.039	-.2366 t 711 P=.024	-.1231 t 711 P=.153	-.2409 t 711 P=.022	.9248 t 711 P=.030	-.0274 t 711 P=.410	.0006 t 711 P=.472	-.2006 t 711 P=.009	.1736 t 711 P=.074	-.0697 t 711 P=.202		
COMLG	-.3907 t 711 P=.000	-.1456 t 711 P=.084	-.0621 t 711 P=.303	-.3326 t 711 P=.002	.5501 t 711 P=.000	-.1757 t 711 P=.071	.1945 t 711 P=.052	-.3546 t 711 P=.001	.0247 t 711 P=.003	-.3023 t 711 P=.001		
CONSH	-.4409 t 711 P=.000	-.3920 t 711 P=.000	-.2897 t 711 P=.007	.0519 t 711 P=.334	.5055 t 711 P=.000	-.3950 t 711 P=.000	.3323 t 711 P=.002	-.0153 t 711 P=.000	.4159 t 711 P=.000	.0263 t 711 P=.417		
ACTLO	.2303 t 711 P=.003	.0023 t 711 P=.240	-.0923 t 711 P=.222	-.1348 t 711 P=.131	-.2210 t 711 P=.032	-.2924 t 711 P=.007	.3544 t 711 P=.001	.3348 t 711 P=.002	-.4297 t 711 P=.000	.2032 t 711 P=.045		
ACTSH	-.2609 t 711 P=.012	-.0049 t 711 P=.000	-.2409 t 711 P=.010	-.1741 t 711 P=.073	.3433 t 711 P=.002	-.1695 t 711 P=.070	.1210 t 711 P=.154	-.0058 t 711 P=.000	.3403 t 711 P=.002	.2005 t 711 P=.009		
INSLG	-.0175 t 711 P=.443	.3218 t 711 P=.003	.0303 t 711 P=.376	.0596 t 711 P=.014	.0420 t 711 P=.364	.2053 t 711 P=.043	-.2190 t 711 P=.033	.1417 t 711 P=.119	.0009 t 711 P=.204	-.4095 t 711 P=.000		
INSSH	-.3294 t 711 P=.003	-.4911 t 711 P=.000	-.1450 t 711 P=.114	-.1087 t 711 P=.057	.3956 t 711 P=.000	-.1011 t 711 P=.045	.1364 t 711 P=.120	-.0040 t 711 P=.000	.4013 t 711 P=.000	.2001 t 711 P=.010		
ONG	.4424 t 711 P=.000	.0010 t 711 P=.449	.0106 t 711 P=.449	-.0006 t 711 P=.498	-.4732 t 711 P=.000	.0404 t 711 P=.022	-.2566 t 711 P=.015	.2795 t 711 P=.009	-.3355 t 711 P=.002	.6546 t 711 P=.000		
PAULA	.0236 t 711 P=.000	.3959 t 711 P=.000	.1136 t 711 P=.173	-.0462 t 711 P=.351	-.5750 t 711 P=.000	.1623 t 711 P=.000	-.1042 t 711 P=.194	.0535 t 711 P=.000	-.0010 t 711 P=.000	.2043 t 711 P=.044		

COEFFICIENT / (CASES) / SIGNIFICANCE)

(A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)

Table J (continued)

SPSS BATCH SYSTEM

FILE NONAME (CREATION DATE = 03/31/80)
SUBFILE CLAS1 CLAS2 CLAS3 CLAS4 CLAS5 CLAS6 CLAS7 CLAS8 CLAS9

	PEARSON CORRELATION COEFFICIENTS									
	HEVSH	RLTS	REPOE	ENHPHP	OTHER	ENO	OPTSK	LISN	IND	SHL
PATSH	-.3844 t 711 P=.000	-.4944 t 711 P=.000	-.1298 t 711 P=.140	-.0877 t 711 P=.234	.3992 t 711 P=.000	-.2219 t 711 P=.031	.1709 t 711 P=.077	-.5588 t 711 P=.000	.4889 t 711 P=.000	.1816 t 711 P=.045
DIAGLO	-.1865 t 711 P=.000	-.2843 t 711 P=.000	.0140 t 711 P=.454	-.3793 t 711 P=.001	.2302 t 711 P=.027	-.4182 t 711 P=.000	.4631 t 711 P=.000	-.4349 t 711 P=.000	.0924 t 711 P=.222	.1619 t 711 P=.000
DIAGSH	-.3148 t 711 P=.004	-.9351 t 711 P=.000	-.1562 t 711 P=.097	-.1806 t 711 P=.044	.3880 t 711 P=.000	-.0377 t 711 P=.378	.0015 t 711 P=.495	-.6848 t 711 P=.000	.4948 t 711 P=.000	.1211 t 711 P=.130
EVALLO	.4054 t 711 P=.000	.0442 t 711 P=.421	-.2531 t 711 P=.017	.0264 t 711 P=.900	-.4737 t 711 P=.000	-.0834 t 711 P=.245	.0617 t 711 P=.305	.4801 t 711 P=.000	-.2154 t 711 P=.004	.4407 t 711 P=.000
EVALSH	-.3634 t 711 P=.002	-.4088 t 711 P=.000	-.0433 t 711 P=.360	.5378 t 711 P=.000	.2493 t 711 P=.018	-.3831 t 711 P=.000	.3295 t 711 P=.003	-.2945 t 711 P=.004	.2787 t 711 P=.001	.1673 t 711 P=.002
ALTNLO	-.1973 t 711 P=.080	-.3804 t 711 P=.001	-.2629 t 711 P=.013	.0624 t 711 P=.900	.0864 t 711 P=.291	-.3907 t 711 P=.000	.2563 t 711 P=.001	-.0049 t 711 P=.484	.4888 t 711 P=.014	-.0408 t 711 P=.344
ALTNSH	-.1497 t 711 P=.104	-.2935 t 711 P=.006	-.0102 t 711 P=.440	-.0832 t 711 P=.246	.1842 t 711 P=.082	.2671 t 711 P=.012	-.2624 t 711 P=.014	-.2979 t 711 P=.004	.4274 t 711 P=.000	-.2316 t 711 P=.024
SPSTACH	-.2173 t 711 P=.034	-.2924 t 711 P=.007	-.2264 t 711 P=.029	.3101 t 711 P=.004	.2347 t 711 P=.024	-.1000 t 711 P=.201	.0632 t 711 P=.320	-.2335 t 711 P=.025	.3382 t 711 P=.002	-.0670 t 711 P=.289
TOTNOT	.4479 t 711 P=.000	-.1203 t 711 P=.159	-.4400 t 711 P=.000	-.3414 t 711 P=.002	-.2892 t 711 P=.009	-.1947 t 711 P=.050	.2144 t 711 P=.035	.2074 t 711 P=.015	-.0034 t 711 P=.900	.7674 t 711 P=.000
PCTSHL	-.3710 t 711 P=.001	-.5288 t 711 P=.000	-.1997 t 711 P=.047	-.1137 t 711 P=.173	.4280 t 711 P=.000	-.2163 t 711 P=.035	.1637 t 711 P=.084	-.0067 t 711 P=.900	.4217 t 711 P=.000	.1998 t 711 P=.047
PHUSLV	-.1033 t 711 P=.194	-.1460 t 711 P=.147	-.1470 t 711 P=.111	.2018 t 711 P=.089	.1022 t 711 P=.198	.0184 t 711 P=.444	.0491 t 711 P=.342	.0015 t 711 P=.493	.1814 t 711 P=.065	-.1102 t 711 P=.167

(COEFFICIENT / (CASES) / SIGNIFICANCE)

(A VALUE OF 99.9999 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)

Table J (continued)

SPSS BATCH SYSTEM

 FILE NONAME ICREATION DATE = 03/31/801
 SUBFILE CLAI CLA2 CLA3 CLA4 CLA5 CLA6 CLA7 CLAR CLA9

	PEARSON	CORRELATION	COEFFICIENTS							
	REVSM	RLTS	REPOE	EMPHIP	OTHER	ENG	OFISK	LISM	IND	SHL
ENGTIME	.3113 (.711) P=.004	.3014 (.711) P=.001	.1985 (.711) P=.049	-.0039 (.711) P=.487	-.3371 (.711) P=.002	.5734 (.711) P=.000	-.5766 (.711) P=.000	.3242 (.711) P=.003	-.1600 (.711) P=.091	-.0565 (.711) P=.320
LISTEN	.7255 (.711) P=.080	.7380 (.711) P=.000	.3264 (.711) P=.003	.0935 (.711) P=.219	-.0467 (.711) P=.000	.6369 (.711) P=.000	-.6172 (.711) P=.000	.7510 (.711) P=.000	-.6550 (.711) P=.000	.1793 (.711) P=.067
INDIV	-.0661 (.711) P=.000	-.6335 (.711) P=.000	.0355 (.711) P=.384	.2356 (.711) P=.024	.8013 (.711) P=.000	-.3440 (.711) P=.002	.3083 (.711) P=.004	-.0150 (.711) P=.000	.9216 (.711) P=.000	-.5574 (.711) P=.000
SMALL	.4379 (.711) P=.000	-.0912 (.711) P=.225	-.4483 (.711) P=.000	-.2802 (.711) P=.009	-.2568 (.711) P=.015	-.1160 (.711) P=.168	.1150 (.711) P=.170	.2477 (.711) P=.019	-.4544 (.711) P=.000	.7673 (.711) P=.000
LANOZ	.5639 (.711) P=.000	.8043 (.711) P=.000	.3072 (.711) P=.000	-.0015 (.711) P=.495	-.6630 (.711) P=.000	.4906 (.711) P=.000	-.4571 (.711) P=.000	.6802 (.711) P=.000	-.6121 (.711) P=.000	-.0905 (.711) P=.207
GAME	.2516 (.711) P=.017	-.1131 (.711) P=.174	-.2262 (.711) P=.029	-.2169 (.711) P=.035	-.1971 (.711) P=.050	-.2597 (.711) P=.014	.2949 (.711) P=.006	.1377 (.711) P=.126	-.3419 (.711) P=.002	.4587 (.711) P=.000
COMPETE	.3991 (.711) P=.000	-.1160 (.711) P=.160	-.3957 (.711) P=.000	-.3813 (.711) P=.001	-.2465 (.711) P=.019	-.1054 (.711) P=.061	.2194 (.711) P=.033	.2425 (.711) P=.021	-.4664 (.711) P=.000	.6277 (.711) P=.000

(A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)

582 (COEFFICIENT / (CASES) / SIGNIFICANCE)

582

Table J (continued)

SPSS BATCH SYSTEM

FILE NONAME ICPEATION DATE = 03/31/80
SUBFILE CLAS1 CLAS2 CLAS3 CLAS4 CLAS5 CLAS6 CLAS7 CLAS8 CLAS9

PEARSON CORRELATION COEFFICIENTS										
	LRN	GAN	COMET	OBJLO	OBJSH	CONLO	CONSH	ACTLO	ACTSH	INSLG
COMP	-.0896 I 711 P=.029	-.0609 I 711 P=.251	-.0727 I 711 P=.273	-.0347 I 711 P=.307	.0143 I 711 P=.453	-.1437 I 711 P=.116	.0373 I 711 P=.379	-.1201 I 711 P=.144	.0244 I 711 P=.414	.0572 I 711 P=.333
PLNSCR	-.5022 I 711 P=.000	-.0571 I 711 P=.318	-.0679 I 711 P=.287	.1433 I 711 P=.117	.0935 I 711 P=.000	-.4027 I 711 P=.000	.3005 I 711 P=.000	-.7353 I 711 P=.000	.9639 I 711 P=.000	-.3662 I 711 P=.001
PPLNSCR	-.5569 I 711 P=.000	-.0932 I 711 P=.220	-.1740 I 711 P=.073	.1095 I 711 P=.057	.5011 I 711 P=.000	-.8047 I 711 P=.000	.4260 I 711 P=.000	-.7423 I 711 P=.000	.9405 I 711 P=.000	-.3101 I 711 P=.003
ORSCLR	.5200 I 711 P=.000	.1203 I 711 P=.159	.0690 I 711 P=.284	.0931 I 711 P=.000	.0654 I 711 P=.294	-.7493 I 711 P=.000	-.4118 I 711 P=.000	-.2120 I 711 P=.037	.9061 I 711 P=.230	-.1932 I 711 P=.053
SUMATT1	.0250 I 711 P=.415	-.0294 I 711 P=.404	-.0945 I 711 P=.217	.0525 I 711 P=.332	.0324 I 711 P=.394	-.1560 I 711 P=.097	.0500 I 711 P=.316	-.0503 I 711 P=.315	.0404 I 711 P=.369	.0110 I 711 P=.444
SUMATT2	-.0053 I 711 P=.240	.0134 I 711 P=.456	-.0514 I 711 P=.335	-.0607 I 711 P=.294	-.0159 I 711 P=.440	.0164 I 711 P=.446	.0172 I 711 P=.443	.0719 I 711 P=.276	-.0049 I 711 P=.471	-.0001 I 711 P=.233
SPERCLR	-.3180 I 711 P=.003	-.0352 I 711 P=.305	-.0140 I 711 P=.444	-.1471 I 711 P=.110	.0091 I 711 P=.470	.1245 I 711 P=.150	.1242 I 711 P=.151	-.0050 I 711 P=.230	.0006 I 711 P=.207	.0295 I 711 P=.404
LSPERCLR	-.1050 I 711 P=.040	-.0104 I 711 P=.466	.0105 I 711 P=.439	-.0472 I 711 P=.340	-.0471 I 711 P=.340	.0670 I 711 P=.209	-.0015 I 711 P=.405	-.0620 I 711 P=.301	.0302 I 711 P=.401	.0196 I 711 P=.436
OUTLNS	.4103 I 711 P=.000	.3627 I 711 P=.001	.3196 I 711 P=.003	.2440 I 711 P=.020	.2101 I 711 P=.022	-.7590 I 711 P=.000	-.3692 I 711 P=.001	.0246 I 711 P=.406	.0036 I 711 P=.400	-.0636 I 711 P=.299
EXPLNS	.6036 I 711 P=.000	.6071 I 711 P=.000	.5990 I 711 P=.000	.1804 I 711 P=.093	-.1603 I 711 P=.091	-.6445 I 711 P=.000	-.6434 I 711 P=.000	.3712 I 711 P=.001	-.4510 I 711 P=.017	-.2019 I 711 P=.000
REVEN	.6237 I 711 P=.000	.4142 I 711 P=.000	.5424 I 711 P=.000	.1206 I 711 P=.150	-.2109 I 711 P=.039	-.3907 I 711 P=.000	-.4609 I 711 P=.000	.2303 I 711 P=.023	-.7609 I 711 P=.012	-.0175 I 711 P=.443

(COEFFICIENT / (CASES) / SIGNIFICANCE)

A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED

Table J (continued)

SPSS BATCH SYSTEM

 FILE HUNAME (CREATION DATE = 03/31/88)
 SUBFILE CLAS1 CLAS2 CLAS3 CLAS4 CLAS5 CLAS6 CLAS7 CLAS8 CLAS9

	PEARSON CORRELATION COEFFICIENTS									
	LNB	GAN	COMET	OBJLO	OBJSH	CONLO	CONSH	ACTLO	ACTSH	INSLO
ALTS	.9095 I .711 P=.000	-.1894 I .711 P=.057	-.1474 I .711 P=.110	.8466 I .711 P=.000	-.2366 I .711 P=.024	-.1655 I .711 P=.004	-.3920 I .711 P=.000	.0823 I .711 P=.248	-.5049 I .711 P=.000	.3218 I .711 P=.003
REPOE	.4441 I .711 P=.000	-.3918 I .711 P=.000	-.8308 I .711 P=.000	.6442 I .711 P=.000	-.1231 I .711 P=.153	-.0621 I .711 P=.303	-.2807 I .711 P=.007	-.0923 I .711 P=.222	-.2469 I .711 P=.019	.0383 I .711 P=.374
ENPHIP	-.0931 I .711 P=.490	-.2074 I .711 P=.041	-.4159 I .711 P=.000	.1739 I .711 P=.073	-.2409 I .711 P=.022	-.3325 I .711 P=.002	.0519 I .711 P=.334	-.1348 I .711 P=.131	-.1741 I .711 P=.073	.2594 I .711 P=.014
OTHER	-.7522 I .711 P=.000	-.3296 I .711 P=.002	-.3534 I .711 P=.001	-.3405 I .711 P=.001	.0248 I .711 P=.030	.8501 I .711 P=.000	.8054 I .711 P=.000	-.2210 I .711 P=.032	.3433 I .711 P=.002	.0420 I .711 P=.364
END	.4023 I .711 P=.000	-.2944 I .711 P=.004	-.1540 I .711 P=.100	.6032 I .711 P=.000	-.0274 I .711 P=.410	-.1757 I .711 P=.071	-.3950 I .711 P=.000	-.2924 I .711 P=.007	-.1695 I .711 P=.079	.2053 I .711 P=.043
OFTSH	-.4497 I .711 P=.000	.3328 I .711 P=.002	.1079 I .711 P=.050	-.5010 I .711 P=.000	.0096 I .711 P=.472	.1945 I .711 P=.052	.3323 I .711 P=.002	.3544 I .711 P=.001	.1210 I .711 P=.154	-.2190 I .711 P=.033
LISH	.7476 I .711 P=.000	.2554 I .711 P=.016	.3573 I .711 P=.001	.1364 I .711 P=.120	-.2006 I .711 P=.009	-.3548 I .711 P=.001	-.5153 I .711 P=.000	.3340 I .711 P=.002	-.5258 I .711 P=.000	.1417 I .711 P=.119
IND	-.7127 I .711 P=.000	-.4717 I .711 P=.000	-.5820 I .711 P=.000	.0134 I .711 P=.455	.1735 I .711 P=.074	.3247 I .711 P=.002	.4159 I .711 P=.000	-.4897 I .711 P=.000	.3403 I .711 P=.002	.0609 I .711 P=.204
SHL	-.1277 I .711 P=.144	.6941 I .711 P=.000	.0155 I .711 P=.000	-.5436 I .711 P=.000	-.0697 I .711 P=.262	-.3023 I .711 P=.001	.0253 I .711 P=.417	.2032 I .711 P=.045	.2805 I .711 P=.009	-.4095 I .711 P=.000
LRO	1.0000 I .711 P=*****	-.0274 I .711 P=.410	.0048 I .711 P=.404	.4625 I .711 P=.000	-.1578 I .711 P=.102	-.0700 I .711 P=.279	-.5303 I .711 P=.000	.3531 I .711 P=.001	-.0607 I .711 P=.000	.3457 I .711 P=.002
GAN	-.0274 I .711 P=.410	1.0000 I .711 P=*****	.9401 I .711 P=.000	-.3675 I .711 P=.001	-.1308 I .711 P=.139	-.3530 I .711 P=.001	-.5051 I .711 P=.000	.6434 I .711 P=.000	-.0102 I .711 P=.447	-.6845 I .711 P=.000

(COEFFICIENT / (CASES) / SIGNIFICANCE)

(A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)

Table J (continued)

SPSS' BATCH SYSTEM

FILE NOWNAME ICREATION DATE = 03/31/88
SURFILE CLAS1 CLAS2 CLAS3 CLAS4 CLAS5 CLAS6 CLAS7 CLAS8 CLAS9

	PEARSON CORRELATION COEFFICIENTS									
	LR0	QAM	COMET	OBJL0	OBJSH	CONLB	CONSH	ACTLB	ACTSH	INSL0
COMET	.0040 1 .711 P=.404	.9401 1 .711 P=.000	1.0000 1 .711 P=*****	-.4614 1 .711 P=.000	-.0860 1 .711 P=.234	-.2495 1 .711 P=.010	-.4395 1 .711 P=.000	.6053 1 .711 P=.000	-.0172 1 .711 P=.443	-.5901 1 .711 P=.000
OBJL0	.6625 1 .711 P=.000	-.3675 1 .711 P=.000	-.4614 1 .711 P=.000	1.0000 1 .711 P=*****	.0316 1 .711 P=.397	-.1113 1 .711 P=.170	-.3644 1 .711 P=.002	-.3651 1 .711 P=.001	-.0932 1 .711 P=.220	.3249 1 .711 P=.003
OBJSH	-.1520 1 .711 P=.102	-.1300 1 .711 P=.139	-.0060 1 .711 P=.926	.0316 1 .711 P=.397	1.0000 1 .711 P=*****	-.3208 1 .711 P=.003	.8137 1 .711 P=.037	-.3772 1 .711 P=.000	.6171 1 .711 P=.000	-.2263 1 .711 P=.029
CONLB	-.0700 1 .711 P=.279	-.3530 1 .711 P=.001	-.2495 1 .711 P=.010	-.1113 1 .711 P=.170	-.3208 1 .711 P=.003	1.0000 1 .711 P=*****	.1607 1 .711 P=.090	.2020 1 .711 P=.046	-.4111 1 .711 P=.000	.4966 1 .711 P=.000
CONSH	-.5303 1 .711 P=.000	-.5051 1 .711 P=.000	-.4395 1 .711 P=.000	-.3644 1 .711 P=.002	.0137 1 .711 P=.037	.1607 1 .711 P=.090	1.0000 1 .711 P=*****	-.6054 1 .711 P=.000	.6354 1 .711 P=.000	.0994 1 .711 P=.000
ACTLB	.3531 1 .711 P=.001	.6434 1 .711 P=.000	.6053 1 .711 P=.000	-.3651 1 .711 P=.001	-.3072 1 .711 P=.000	.2020 1 .711 P=.046	-.6054 1 .711 P=.000	1.0000 1 .711 P=*****	-.0000 1 .711 P=.000	-.2354 1 .711 P=.024
ACTSH	-.6607 1 .711 P=.000	-.0162 1 .711 P=.447	-.0172 1 .711 P=.443	-.0913 1 .711 P=.220	.6171 1 .711 P=.000	-.4111 1 .711 P=.000	.9354 1 .711 P=.000	-.6090 1 .711 P=.000	1.0000 1 .711 P=*****	-.4159 1 .711 P=.000
INSL0	.3457 1 .711 P=.002	-.6045 1 .711 P=.000	-.5901 1 .711 P=.000	.3249 1 .711 P=.003	-.2263 1 .711 P=.029	.4966 1 .711 P=.000	.2996 1 .711 P=.006	-.2354 1 .711 P=.024	-.4159 1 .711 P=.000	1.0000 1 .711 P=*****
INSSH	-.7105 1 .711 P=.000	-.0620 1 .711 P=.301	-.0013 1 .711 P=.250	-.0591 1 .711 P=.310	.4706 1 .711 P=.000	-.2000 1 .711 P=.000	.5671 1 .711 P=.000	-.6791 1 .711 P=.000	.9619 1 .711 P=.000	-.3093 1 .711 P=.000
BR0	-.1570 1 .711 P=.094	.6569 1 .711 P=.000	.4360 1 .711 P=.000	-.1030 1 .711 P=.196	-.0175 1 .711 P=.442	-.7600 1 .711 P=.000	-.1406 1 .711 P=.121	-.1445 1 .711 P=.115	.4360 1 .711 P=.000	-.6096 1 .711 P=.000
PATLB	.5472 1 .711 P=.000	.0771 1 .711 P=.000	.5604 1 .711 P=.000	-.1251 1 .711 P=.149	-.3973 1 .711 P=.000	-.0643 1 .711 P=.297	-.0210 1 .711 P=.000	.0712 1 .711 P=.000	-.7202 1 .711 P=.000	-.2041 1 .711 P=.013

(COEFFICIENT / (CASES) / SIGNIFICANCE)

A VALUE OF .99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED

Table J (continued)

SPSS BATCH SYSTEM

FILE MONAME ICREATION DATE = 03/31/80
SUBFILE CLAI CLAI2 CLAI3 CLAI4 CLAI5 CLAI6 CLAI7 CLAI8 CLAI9

	PEARSON CORRELATION COEFFICIENTS									
	LR0	QAM	COMET	DRJLO	DRJSH	CONLO	CONSH	ACTLO	ACTSH	INSL0
PATSH	-.6656 I 711 P=.000	-.6964 I 711 P=.012	-.1233 I 711 P=.153	-.1490 I 711 P=.107	.6542 I 711 P=.000	-.4208 I 711 P=.000	.8761 I 711 P=.000	-.6679 I 711 P=.000	.9688 I 711 P=.000	-.4472 I 711 P=.000
DIABLA	-.2607 I 711 P=.014	.4481 I 711 P=.000	.3218 I 711 P=.003	.9392 I 711 P=.373	-.2779 I 711 P=.009	.2604 I 711 P=.012	-.1408 I 711 P=.121	.8563 I 711 P=.015	.1143 I 711 P=.171	-.3395 I 711 P=.002
DIAGSH	-.7309 I 711 P=.000	-.6714 I 711 P=.030	-.6483 I 711 P=.344	.1217 I 711 P=.136	.3126 I 711 P=.004	-.1787 I 711 P=.060	.3398 I 711 P=.002	-.6643 I 711 P=.000	.8601 I 711 P=.000	-.3520 I 711 P=.001
EVALLO	.0062 I 711 P=.479	.4798 I 711 P=.000	.3779 I 711 P=.001	-.2499 I 711 P=.010	-.3913 I 711 P=.000	-.8983 I 711 P=.000	-.1584 I 711 P=.093	.2109 I 711 P=.933	-.1102 I 711 P=.163	-.1003 I 711 P=.050
EVALSH	-.6175 I 711 P=.000	.8441 I 711 P=.350	-.6977 I 711 P=.209	-.4102 I 711 P=.000	-.2541 I 711 P=.013	-.3122 I 711 P=.004	.4033 I 711 P=.000	-.1954 I 711 P=.051	.3249 I 711 P=.003	-.3101 I 711 P=.003
ALTNLO	-.2902 I 711 P=.009	.1400 I 711 P=.122	-.8407 I 711 P=.360	-.8396 I 711 P=.022	-.1270 I 711 P=.146	-.3706 I 711 P=.001	.1254 I 711 P=.149	.9310 I 711 P=.309	-.8021 I 711 P=.493	.8056 I 711 P=.401
ALTNSH	-.3300 I 711 P=.002	.0265 I 711 P=.413	-.6877 I 711 P=.475	.4384 I 711 P=.000	-.1270 I 711 P=.146	.8070 I 711 P=.042	-.2984 I 711 P=.006	-.2132 I 711 P=.837	.1359 I 711 P=.129	-.0529 I 711 P=.331
SPST	-.3604 I 711 P=.001	-.2336 I 711 P=.025	-.2549 I 711 P=.016	.0116 I 711 P=.462	.1639 I 711 P=.124	-.1222 I 711 P=.155	.4222 I 711 P=.000	-.4675 I 711 P=.000	.3625 I 711 P=.001	.1794 I 711 P=.067
TOTNOT	-.0500 I 711 P=.339	.7497 I 711 P=.000	.7169 I 711 P=.000	-.4400 I 711 P=.000	-.0545 I 711 P=.314	-.2749 I 711 P=.010	-.1966 I 711 P=.050	.4041 I 711 P=.000	.1074 I 711 P=.106	-.5114 I 711 P=.000
PCTSHL	-.6947 I 711 P=.000	-.6940 I 711 P=.006	-.1170 I 711 P=.176	-.1205 I 711 P=.143	.6299 I 711 P=.000	-.3010 I 711 P=.001	.5981 I 711 P=.000	-.7049 I 711 P=.000	.9893 I 711 P=.000	-.3926 I 711 P=.000
PROSLV	-.1224 I 711 P=.158	-.1946 I 711 P=.052	-.1740 I 711 P=.073	-.0944 I 711 P=.217	.0950 I 711 P=.210	-.0505 I 711 P=.314	.1734 I 711 P=.074	-.1669 I 711 P=.082	.0360 I 711 P=.383	.1592 I 711 P=.092

(COEFFICIENT / (CASES) / SIGNIFICANCE)

A VALUE OF 99.9999 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)

Table J (continued)

SPSS BATCH SYSTEM

FILE NONAME (CREATION DATE = 03/31/80)

SUBFILE CLA1 CLA2 CLA3 CLA4 CLA5 CLA6 CLA7 CLA8 CLA9

PEARSON CORRELATION COEFFICIENTS										
	LRO	GAH	CONET	OBJLO	OBJSH	CONLO	CONSH	ACTLO	ACTSH	INSLO
ENOTIME	.2499 (.71) P=.018	-.1827 (.71) P=.064	-.1037 (.71) P=.195	.3286 (.71) P=.003	-.0240 (.71) P=.421	-.1240 (.71) P=.151	-.1978 (.71) P=.050	-.2006 (.71) P=.047	-.0739 (.71) P=.270	.1177 (.71) P=.164
LISTEN	.6594 (.71) P=.000	.1191 (.71) P=.161	.1403 (.71) P=.122	.4280 (.71) P=.000	-.0508 (.71) P=.313	-.5284 (.71) P=.000	-.4597 (.71) P=.000	.0107 (.71) P=.438	-.2066 (.71) P=.042	-.0008 (.71) P=.471
INDIV	-.6566 (.71) P=.000	-.4093 (.71) P=.000	-.5209 (.71) P=.000	.0128 (.71) P=.458	.1960 (.71) P=.051	.2957 (.71) P=.006	.3815 (.71) P=.001	-.3792 (.71) P=.001	.3306 (.71) P=.002	.0441 (.71) P=.357
SMALL	-.1100 (.71) P=.181	.5518 (.71) P=.000	.6352 (.71) P=.000	-.4335 (.71) P=.000	-.0355 (.71) P=.384	-.3068 (.71) P=.005	.0210 (.71) P=.431	.1604 (.71) P=.000	.2231 (.71) P=.031	-.3906 (.71) P=.008
LARGE	.8491 (.71) P=.000	-.0597 (.71) P=.311	-.0128 (.71) P=.458	.3967 (.71) P=.000	-.1891 (.71) P=.097	-.0417 (.71) P=.365	-.4541 (.71) P=.000	.2726 (.71) P=.011	-.5888 (.71) P=.000	.3208 (.71) P=.003
GAME	.0283 (.71) P=.433	.6977 (.71) P=.000	.6506 (.71) P=.000	-.2574 (.71) P=.015	-.0738 (.71) P=.270	-.1827 (.71) P=.064	-.3560 (.71) P=.001	.5039 (.71) P=.000	-.0394 (.71) P=.372	-.4810 (.71) P=.000
COMPETE	.0282 (.71) P=.414	.7605 (.71) P=.000	.7981 (.71) P=.000	-.3769 (.71) P=.001	-.0564 (.71) P=.320	-.1495 (.71) P=.107	-.3544 (.71) P=.001	.5366 (.71) P=.000	-.0387 (.71) P=.384	-.4087 (.71) P=.000

(COEFFICIENT / (CASES) / SIGNIFICANCE)

(A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)

Table J (continued)

SPSS BATCH SYSTEM

FILE NONAME
SUBFILE CLAIICREATION DATE = 03/31/88
CLAI CLAI2 CLAI3

CLAI4

CLAI5

CLAI6

CLAI7

CLAI8

CLAI9

	PEARSON CORRELATION COEFFICIENTS									
	INSSM	DRG	MATLO	MATSH	DIAOLO	DIAOSH	EVALLO	EVALSH	ALIMLO	ALIMSH
COMP	-.0144 I .711 P=.453	.0831 I .711 P=.245	-.0330 I .711 P=.392	.0414 I .711 P=.366	-.0224 I .711 P=.087	.0118 I .711 P=.441	.2223 I .711 P=.031	.1725 I .711 P=.075	.0704 I .711 P=.011	.0304 I .711 P=.409
PLNSCR	.9036 I .711 P=.000	.4172 I .711 P=.000	-.6170 I .711 P=.000	.9175 I .711 P=.000	.0745 I .711 P=.269	.0466 I .711 P=.000	-.1735 I .711 P=.074	.1535 I .711 P=.101	-.0709 I .711 P=.278	.2160 I .711 P=.035
PPLNSCR	.9873 I .711 P=.000	.4010 I .711 P=.000	-.7466 I .711 P=.000	.9076 I .711 P=.000	.1078 I .711 P=.181	.0592 I .711 P=.000	-.0502 I .711 P=.315	.3127 I .711 P=.004	.1119 I .711 P=.176	.2440 I .711 P=.020
OBSCLR	.0501 I .711 P=.319	.6299 I .711 P=.000	.1864 I .711 P=.060	.0552 I .711 P=.321	-.1675 I .711 P=.079	.0380 I .711 P=.374	.2909 I .711 P=.006	-.0927 I .711 P=.221	-.1018 I .711 P=.199	-.0202 I .711 P=.400
SUMATT1	.0200 I .711 P=.400	.0367 I .711 P=.301	-.0555 I .711 P=.323	.0606 I .711 P=.205	-.0539 I .711 P=.320	-.0231 I .711 P=.424	.1193 I .711 P=.161	.1171 I .711 P=.165	.1684 I .711 P=.000	-.1164 I .711 P=.167
SUMATT2	.0067 I .711 P=.470	-.0307 I .711 P=.400	.0130 I .711 P=.457	.0373 I .711 P=.379	.0661 I .711 P=.292	-.0104 I .711 P=.439	.0097 I .711 P=.460	.1364 I .711 P=.120	.1009 I .711 P=.203	-.0470 I .711 P=.346
SPENCLR	.0936 I .711 P=.219	-.0037 I .711 P=.944	-.1446 I .711 P=.114	.0797 I .711 P=.254	-.0247 I .711 P=.419	.1703 I .711 P=.070	.0244 I .711 P=.413	.1302 I .711 P=.140	.1729 I .711 P=.075	.2120 I .711 P=.037
LSPENCLR	.0309 I .711 P=.399	-.0019 I .711 P=.994	-.0429 I .711 P=.358	.0011 I .711 P=.497	-.0425 I .711 P=.379	.1259 I .711 P=.140	.0535 I .711 P=.320	.0470 I .711 P=.209	.0973 I .711 P=.210	.2317 I .711 P=.024
OUTLWS	-.1062 I .711 P=.060	.3346 I .711 P=.002	.2617 I .711 P=.014	-.0539 I .711 P=.320	-.3000 I .711 P=.001	-.1749 I .711 P=.072	.0917 I .711 P=.000	-.1934 I .711 P=.101	.4024 I .711 P=.000	-.1410 I .711 P=.119
EXPLWS	-.3346 I .711 P=.002	.5630 I .711 P=.000	.6549 I .711 P=.000	-.3160 I .711 P=.004	-.1065 I .711 P=.100	-.3257 I .711 P=.003	.0804 I .711 P=.000	-.1713 I .711 P=.077	.0537 I .711 P=.320	-.1737 I .711 P=.074
REVEN	-.3294 I .711 P=.003	.4424 I .711 P=.000	.5236 I .711 P=.000	-.3044 I .711 P=.000	-.1465 I .711 P=.060	-.3148 I .711 P=.004	.4054 I .711 P=.000	-.3434 I .711 P=.002	-.1973 I .711 P=.050	-.1407 I .711 P=.104

(COEFFICIENT / CASES) / SIGNIFICANCE)

(A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)

Table J (continued)

SPSS BATCH SYSTEM

FILE NONAME (CREATION DATE = 03/31/80)

SUBFILE	CLAS1	CLAS2	CLAS3	CLAS4	CLAS5	CLAS6	CLAS7	CLAS8	CLAS9	
PEARSON CORRELATION COEFFICIENTS										
	INRSH	ORG	MATLO	MATSH	DIAOLO	DIAOSH	EVALLO	EVALSH	ALTNLO	ALTNSH
ALTS	-.4911 (.711) P=.000	.0018 (.711) P=.249	.3959 (.711) P=.000	-.4944 (.711) P=.000	-.2063 (.711) P=.000	-.5351 (.711) P=.000	.0242 (.711) P=.421	-.4000 (.711) P=.000	-.3504 (.711) P=.001	-.2935 (.711) P=.000
REPOE	-.1450 (.711) P=.114	.0106 (.711) P=.439	.1136 (.711) P=.173	-.1298 (.711) P=.140	.0140 (.711) P=.454	-.1562 (.711) P=.097	-.2931 (.711) P=.017	-.0433 (.711) P=.360	-.2629 (.711) P=.013	-.0104 (.711) P=.440
ENPHIP	-.1007 (.711) P=.057	-.0006 (.711) P=.490	-.0462 (.711) P=.351	-.0077 (.711) P=.274	-.3793 (.711) P=.001	-.1005 (.711) P=.066	.6264 (.711) P=.000	.0370 (.711) P=.000	.0624 (.711) P=.000	-.0032 (.711) P=.245
OTHER	.3956 (.711) P=.000	-.4732 (.711) P=.000	-.5750 (.711) P=.000	.3992 (.711) P=.000	.2302 (.711) P=.027	.3000 (.711) P=.000	-.4737 (.711) P=.000	.2493 (.711) P=.010	.0644 (.711) P=.291	.1042 (.711) P=.002
ENG	-.1011 (.711) P=.005	.2404 (.711) P=.022	.1623 (.711) P=.000	-.2219 (.711) P=.031	-.4102 (.711) P=.000	-.0377 (.711) P=.376	-.0034 (.711) P=.245	-.3031 (.711) P=.000	-.3907 (.711) P=.000	.2671 (.711) P=.012
OFTSH	.1364 (.711) P=.120	-.2566 (.711) P=.015	-.1042 (.711) P=.194	.1709 (.711) P=.077	.4631 (.711) P=.000	.0010 (.711) P=.495	.0617 (.711) P=.305	.3295 (.711) P=.003	.2563 (.711) P=.001	-.2624 (.711) P=.014
LISH	-.6040 (.711) P=.000	.2795 (.711) P=.009	.6535 (.711) P=.000	-.5605 (.711) P=.000	-.4349 (.711) P=.000	-.6040 (.711) P=.000	.4091 (.711) P=.000	-.2745 (.711) P=.000	-.0049 (.711) P=.404	-.2979 (.711) P=.000
IND	.4013 (.711) P=.000	-.3355 (.711) P=.002	-.6016 (.711) P=.000	.4000 (.711) P=.000	.0924 (.711) P=.772	.4940 (.711) P=.000	-.3156 (.711) P=.004	.3707 (.711) P=.001	.2606 (.711) P=.014	.4274 (.711) P=.000
SML	.2501 (.711) P=.010	.6545 (.711) P=.000	.2043 (.711) P=.044	.1016 (.711) P=.045	.1610 (.711) P=.009	.1311 (.711) P=.130	.4407 (.711) P=.000	.1473 (.711) P=.002	-.0406 (.711) P=.344	-.2315 (.711) P=.026
LRO	-.7105 (.711) P=.000	-.1570 (.711) P=.096	.5672 (.711) P=.000	-.6656 (.711) P=.000	-.2607 (.711) P=.014	-.7309 (.711) P=.000	.0062 (.711) P=.479	-.6175 (.711) P=.000	-.2002 (.711) P=.009	-.3300 (.711) P=.002
GAM	-.0620 (.711) P=.301	.4569 (.711) P=.000	.5771 (.711) P=.000	-.0964 (.711) P=.212	.4401 (.711) P=.000	-.0214 (.711) P=.430	.6700 (.711) P=.000	.0441 (.711) P=.350	.1400 (.711) P=.192	.0265 (.711) P=.413

(COEFFICIENT / (CASES) / SIGNIFICANCE)

A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED

Table J (continued)

SPSS BATCH SYSTEM

FILE NONAME (CREATION DATE = 03/31/80)

SUBFILE CLAI CLAF CLAS CLAB CLAE CLAT CLAD CLAF

	PEARSON CORRELATION COEFFICIENTS									
	INSM	ORG	PATLO	HATSH	DIABLO	DIAOSH	EVALLO	EVALSH	ALINLO	ALINSH
COMET	-.0812 t 711 P=.258	.4368 t 711 P=.000	.5686 t 711 P=.000	-.1233 t 711 P=.153	.3218 t 711 P=.003	-.0403 t 711 P=.344	.3779 t 711 P=.001	-.0977 t 711 P=.289	-.0407 t 711 P=.368	-.0077 t 711 P=.472
ORJLO	-.0581 t 711 P=.319	-.1038 t 711 P=.194	-.1251 t 711 P=.149	-.1490 t 711 P=.107	.0392 t 711 P=.373	.1217 t 711 P=.156	-.7499 t 711 P=.018	-.4102 t 711 P=.000	-.7396 t 711 P=.022	.4384 t 711 P=.000
ORJSH	.4206 t 711 P=.000	-.0175 t 711 P=.442	-.3973 t 711 P=.000	.6542 t 711 P=.000	-.2779 t 711 P=.009	.3126 t 711 P=.004	-.3913 t 711 P=.000	-.2641 t 711 P=.013	-.1270 t 711 P=.146	-.1270 t 711 P=.146
CONLO	-.2800 t 711 P=.008	-.7600 t 711 P=.000	-.0643 t 711 P=.297	-.4208 t 711 P=.000	.2604 t 711 P=.012	-.1787 t 711 P=.068	-.5903 t 711 P=.000	-.3122 t 711 P=.004	-.3786 t 711 P=.001	.2070 t 711 P=.042
CONSH	.5671 t 711 P=.000	-.1404 t 711 P=.121	-.8210 t 711 P=.000	.5701 t 711 P=.000	-.1406 t 711 P=.121	.3398 t 711 P=.002	-.1504 t 711 P=.093	.4033 t 711 P=.000	.1264 t 711 P=.149	-.2904 t 711 P=.008
ACTLO	-.6991 t 711 P=.000	-.1445 t 711 P=.115	.0712 t 711 P=.000	-.6679 t 711 P=.000	.2563 t 711 P=.015	-.6443 t 711 P=.000	.2189 t 711 P=.033	-.1954 t 711 P=.051	.0310 t 711 P=.399	-.7132 t 711 P=.037
ACTSH	.9419 t 711 P=.000	.4342 t 711 P=.000	-.7202 t 711 P=.000	.9600 t 711 P=.000	.1143 t 711 P=.171	.0401 t 711 P=.000	-.1102 t 711 P=.163	.3249 t 711 P=.003	-.0021 t 711 P=.493	.1359 t 711 P=.129
INSL0	-.3893 t 711 P=.000	-.6896 t 711 P=.000	-.2441 t 711 P=.013	-.4472 t 711 P=.000	-.3395 t 711 P=.002	-.3529 t 711 P=.001	-.1883 t 711 P=.058	-.3181 t 711 P=.003	.0056 t 711 P=.401	-.0529 t 711 P=.331
INSM	1.0000 t 711 P=.	.4401 t 711 P=.000	-.7604 t 711 P=.000	.9250 t 711 P=.000	.2732 t 711 P=.011	.9166 t 711 P=.000	-.1579 t 711 P=.094	.4094 t 711 P=.000	-.0701 t 711 P=.281	.2220 t 711 P=.031
ORG	.4401 t 711 P=.000	1.0000 t 711 P=.	.1226 t 711 P=.154	.4193 t 711 P=.000	.0094 t 711 P=.489	.3702 t 711 P=.001	.8276 t 711 P=.000	.4750 t 711 P=.000	.9040 t 711 P=.043	-.0175 t 711 P=.442
PATLO	-.7604 t 711 P=.000	.1226 t 711 P=.154	1.0000 t 711 P=.	-.7045 t 711 P=.000	-.0113 t 711 P=.463	-.6078 t 711 P=.000	.3437 t 711 P=.002	-.2257 t 711 P=.029	-.0144 t 711 P=.453	-.1000 t 711 P=.091

(COEFFICIENT / (CASES) / SIGNIFICANCE)

(A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)

Table J (continued)

SPSS MATCH SYSTEM

FILE NONAME (CREATION DATE = 03/31/00)

SUBFILE CLAS1 CLAS2 CLAS3 CLAS4 CLAS5 CLAS6 CLAS7 CLAS8 CLAS9

PEARSON CORRELATION COEFFICIENTS											
	INSSH	ORG	MATLQ	MATSH	DIAQLQ	DIAOSH	EVALLO	EVALSH	ALTMLO	ALTMSH	
PATSH	.9250 1 .711 P=.000	.4193 1 .711 P=.000	-.7045 1 .711 P=.000	1.0000 1 .711 P=*****	.0133 1 .711 P=.456	.7692 1 .711 P=.000	-.1234 1 .711 P=.153	.4197 1 .711 P=.000	.9567 1 .711 P=.319	-.0044 1 .711 P=.486	
DIAQLQ	.2732 1 .711 P=.011	.0094 1 .711 P=.469	-.0113 1 .711 P=.463	.0133 1 .711 P=.456	1.0000 1 .711 P=*****	.3807 1 .711 P=.001	-.2125 1 .711 P=.038	-.0161 1 .711 P=.447	-.2779 1 .711 P=.009	.4260 1 .711 P=.000	
DIAOSH	.9144 1 .711 P=.000	.3702 1 .711 P=.001	-.6478 1 .711 P=.000	.7692 1 .711 P=.000	.3807 1 .711 P=.001	1.0000 1 .711 P=*****	-.1053 1 .711 P=.061	.2899 1 .711 P=.007	-.0072 1 .711 P=.275	.5900 1 .711 P=.000	
EVALLO	-.1579 1 .711 P=.094	.0276 1 .711 P=.000	.3437 1 .711 P=.002	-.1234 1 .711 P=.153	-.2125 1 .711 P=.038	-.1053 1 .711 P=.061	1.0000 1 .711 P=*****	.5622 1 .711 P=.000	.7624 1 .711 P=.000	-.1968 1 .711 P=.050	
EVALSH	.4694 1 .711 P=.000	.4750 1 .711 P=.000	-.2257 1 .711 P=.029	.4197 1 .711 P=.000	-.0161 1 .711 P=.447	.2899 1 .711 P=.007	.5622 1 .711 P=.000	1.0000 1 .711 P=*****	.6333 1 .711 P=.000	-.1174 1 .711 P=.164	
ALTMLO	-.0701 1 .711 P=.201	.0840 1 .711 P=.243	-.0144 1 .711 P=.453	.0567 1 .711 P=.319	-.2779 1 .711 P=.009	-.0072 1 .711 P=.275	.7624 1 .711 P=.000	.6333 1 .711 P=.000	1.0000 1 .711 P=*****	-.1270 1 .711 P=.166	
ALTMSH	.9220 1 .711 P=.031	-.0175 1 .711 P=.442	-.1600 1 .711 P=.091	-.0044 1 .711 P=.486	.4260 1 .711 P=.000	.5900 1 .711 P=.000	-.1968 1 .711 P=.050	-.1174 1 .711 P=.164	-.1270 1 .711 P=.166	1.0000 1 .711 P=*****	
SPSTACH	.3424 1 .711 P=.002	.0034 1 .711 P=.489	-.4980 1 .711 P=.000	.3402 1 .711 P=.002	-.1531 1 .711 P=.101	.3373 1 .711 P=.002	.1345 1 .711 P=.132	.2024 1 .711 P=.009	.3464 1 .711 P=.002	.1009 1 .711 P=.103	
TOTNOT	.0696 1 .711 P=.205	.4494 1 .711 P=.000	.3534 1 .711 P=.001	.0205 1 .711 P=.407	.2764 1 .711 P=.010	.0196 1 .711 P=.436	.3438 1 .711 P=.002	.0349 1 .711 P=.306	-.0253 1 .711 P=.417	-.1303 1 .711 P=.139	
PCTSHL	.9539 1 .711 P=.000	.3895 1 .711 P=.000	-.7504 1 .711 P=.000	.9900 1 .711 P=.000	.0592 1 .711 P=.312	.0241 1 .711 P=.000	-.1374 1 .711 P=.124	.3849 1 .711 P=.000	.9410 1 .711 P=.360	.0750 1 .711 P=.267	
PRBSLV	-.0210 1 .711 P=.424	-.0612 1 .711 P=.300	-.1279 1 .711 P=.144	.0701 1 .711 P=.201	-.3670 1 .711 P=.001	-.0302 1 .711 P=.401	.1483 1 .711 P=.109	.1574 1 .711 P=.095	.3020 1 .711 P=.005	-.0559 1 .711 P=.322	

(COEFFICIENT / (CASES) / SIGNIFICANCE)

A VALUE OF 99.9999 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED

Table J (continued)

SPSS BATCH SYSTEM

FILE NONAME (CREATION DATE = 03/31/80)
SUBFILE CLA1 CLA2 CLA3 CLA4 CLA5 CLA6 CLA7 CLA8 CLA9

	PEARSON CORRELATION COEFFICIENTS									
	INSSH	ORO	MATLO	MATSH	DIAGLO	DIAOSH	EVALLO	EVALSH	ALTNLO	ALTNSH
ENSTIME	-.0801 (.71) P=.253	.1850 (.71) P=.085	.0606 (.71) P=.285	-.1812 (.71) P=.201	-.2497 (.71) P=.011	.0003 (.71) P=.499	-.0079 (.71) P=.474	-.1439 (.71) P=.086	-.1819 (.71) P=.064	.1562 (.71) P=.097
LISTEN	-.2626 (.71) P=.013	.4151 (.71) P=.000	.3830 (.71) P=.000	-.2339 (.71) P=.025	-.3035 (.71) P=.005	-.2666 (.71) P=.012	.3075 (.71) P=.005	-.2334 (.71) P=.025	-.1869 (.71) P=.187	-.1476 (.71) P=.110
INDIV	.3810 (.71) P=.081	-.3284 (.71) P=.003	-.5603 (.71) P=.000	.3924 (.71) P=.000	.1214 (.71) P=.157	.4611 (.71) P=.000	-.3127 (.71) P=.004	.3257 (.71) P=.003	.2341 (.71) P=.025	.3037 (.71) P=.000
SMALL	.1931 (.71) P=.053	.4973 (.71) P=.000	.1582 (.71) P=.094	.1506 (.71) P=.105	.1255 (.71) P=.149	.0977 (.71) P=.209	.3511 (.71) P=.001	.1385 (.71) P=.125	-.0087 (.71) P=.471	-.1893 (.71) P=.057
LARGE	-.6171 (.71) P=.000	-.1018 (.71) P=.199	.4869 (.71) P=.000	-.5893 (.71) P=.000	-.2353 (.71) P=.016	-.6171 (.71) P=.000	.0195 (.71) P=.436	-.5013 (.71) P=.000	-.2577 (.71) P=.015	-.2551 (.71) P=.016
GAME	-.0650 (.71) P=.295	.2526 (.71) P=.017	.4182 (.71) P=.000	-.0868 (.71) P=.236	.3779 (.71) P=.001	-.0548 (.71) P=.325	.2427 (.71) P=.021	-.0313 (.71) P=.398	.0189 (.71) P=.438	-.0262 (.71) P=.414
COMPLETE	-.0814 (.71) P=.250	.2932 (.71) P=.007	.4806 (.71) P=.000	-.1119 (.71) P=.176	.3194 (.71) P=.003	-.0703 (.71) P=.280	.2348 (.71) P=.024	-.1179 (.71) P=.164	-.0815 (.71) P=.250	-.0425 (.71) P=.362

(COEFFICIENT / (CASES) / SIGNIFICANCE)

(A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)

Table J (continued)

SPSS BATCH SYSTEM

FILE MONAME (CREATION DATE = 03/31/99)
SUBFILE CLAS1 CLAS2 CLAS3 CLAS4 CLAS5 CLAS6 CLAS7 CLAS8 CLAS9

	PEARSON CORRELATION COEFFICIENTS									
	SPSTACH	TOTHTOT	PCTSHL	PRASLV	ENRTIME	LISTEN	INDIV	SMALL	LARGE	GAME
COMP	.6798 I .711 P=.000	.0472 I .711 P=.340	.0396 I .711 P=.371	.7012 I .711 P=.000	.4452 I .711 P=.000	.2077 I .711 P=.041	.0202 I .711 P=.498	-.1039 I .711 P=.194	.0676 I .711 P=.208	.2155 I .711 P=.034
PLNSCH	.3305 I .711 P=.002	.0301 I .711 P=.376	.9308 I .711 P=.000	.0141 I .711 P=.440	.0204 I .711 P=.433	-.0540 I .711 P=.221	.2705 I .711 P=.009	.1405 I .711 P=.121	-.4513 I .711 P=.000	-.0601 I .711 P=.706
PPLNSCH	.4110 I .711 P=.000	-.0407 I .711 P=.360	.9200 I .711 P=.000	.0463 I .711 P=.351	-.0219 I .711 P=.420	-.0970 I .711 P=.211	.3021 I .711 P=.001	.0601 I .711 P=.206	-.4999 I .711 P=.000	-.1019 I .711 P=.190
OBSCLR	-.0799 I .711 P=.254	.0096 I .711 P=.329	.0264 I .711 P=.413	-.1043 I .711 P=.193	.3674 I .711 P=.001	.0030 I .711 P=.000	-.5066 I .711 P=.000	.1225 I .711 P=.154	.4562 I .711 P=.000	.0400 I .711 P=.345
SUMATT1	.3100 I .711 P=.004	.0500 I .711 P=.337	.0545 I .711 P=.326	.1046 I .711 P=.042	.0030 I .711 P=.645	.0912 I .711 P=.225	-.0006 I .711 P=.498	.0144 I .711 P=.452	-.0129 I .711 P=.450	.1171 I .711 P=.165
SUMATT2	.3047 I .711 P=.005	.0573 I .711 P=.317	.0173 I .711 P=.443	.2144 I .711 P=.036	.2659 I .711 P=.013	-.0240 I .711 P=.421	.1109 I .711 P=.162	-.0644 I .711 P=.297	-.0700 I .711 P=.279	.2034 I .711 P=.044
SPERCLR	.5720 I .711 P=.000	-.0432 I .711 P=.340	.1042 I .711 P=.189	.5113 I .711 P=.000	.1067 I .711 P=.040	-.1467 I .711 P=.111	.2405 I .711 P=.010	-.1491 I .711 P=.107	-.1307 I .711 P=.123	.0901 I .711 P=.227
LSPERCLR	.4049 I .711 P=.000	-.0140 I .711 P=.451	.0243 I .711 P=.420	.4402 I .711 P=.000	.2404 I .711 P=.010	-.0040 I .711 P=.404	.0900 I .711 P=.204	-.1056 I .711 P=.190	-.0120 I .711 P=.461	.0900 I .711 P=.227
OUTLNS	.0009 I .711 P=.230	.2309 I .711 P=.022	-.0606 I .711 P=.308	.1046 I .711 P=.193	.1624 I .711 P=.000	.6047 I .711 P=.000	-.4605 I .711 P=.000	.2123 I .711 P=.010	.3273 I .711 P=.003	.1004 I .711 P=.057
EXPLNS	-.2425 I .711 P=.021	.4774 I .711 P=.000	-.3394 I .711 P=.002	-.1175 I .711 P=.145	.2174 I .711 P=.034	.7550 I .711 P=.000	-.7003 I .711 P=.000	.3943 I .711 P=.000	.5140 I .711 P=.000	.3903 I .711 P=.000
REVEN	-.2173 I .711 P=.034	.4479 I .711 P=.000	-.3710 I .711 P=.001	-.1033 I .711 P=.194	.3113 I .711 P=.004	.7259 I .711 P=.000	-.0601 I .711 P=.000	.4379 I .711 P=.000	.5439 I .711 P=.000	.2510 I .711 P=.017

(COEFFICIENT / CASES) / SIGNIFICANCE)

A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED

Table J (continued)

SPSS BATCH SYSTEM

FILE NONAME ICREATION DATE = 03/31/88

SUBFILE CLAI CLAZ CLA3 CLA4 CLAS CLAG CLAT CLAN CLAG

	PEARSON CORRELATION COEFFICIENTS									
	SPSTACH	TOTMUT	PCTSHL	PHBSLV	ENOTIME	LISTEN	INDIV	SMALL	LARGE	GAME
ALTS	-.2924 I .711 P=.007	-.1203 I .711 P=.159	-.5200 I .711 P=.000	-.1260 I .711 P=.147	.3614 I .711 P=.001	.7380 I .711 P=.000	-.6335 I .711 P=.000	-.0912 I .711 P=.225	.0043 I .711 P=.000	-.1131 I .711 P=.174
REPOE	-.2264 I .711 P=.029	-.4460 I .711 P=.000	-.1997 I .711 P=.047	-.1670 I .711 P=.111	.1905 I .711 P=.049	.3264 I .711 P=.003	.0355 I .711 P=.384	-.4053 I .711 P=.000	.3072 I .711 P=.000	-.2262 I .711 P=.029
ENPHIP	.3101 I .711 P=.004	-.3414 I .711 P=.002	-.1137 I .711 P=.173	.2010 I .711 P=.002	-.0039 I .711 P=.407	.0935 I .711 P=.219	.2356 I .711 P=.024	-.2802 I .711 P=.009	-.0018 I .711 P=.495	-.2169 I .711 P=.015
OTHER	.2347 I .711 P=.024	-.2802 I .711 P=.009	.4200 I .711 P=.000	.1022 I .711 P=.170	-.3371 I .711 P=.002	-.0467 I .711 P=.000	.0013 I .711 P=.000	-.2548 I .711 P=.015	-.0430 I .711 P=.000	-.1971 I .711 P=.050
ENG	-.1008 I .711 P=.201	-.1967 I .711 P=.050	-.2153 I .711 P=.035	.0164 I .711 P=.444	.5734 I .711 P=.000	.6369 I .711 P=.000	-.3440 I .711 P=.002	-.1160 I .711 P=.160	.4906 I .711 P=.000	-.2597 I .711 P=.014
OFTSH	.0532 I .711 P=.330	.2164 I .711 P=.035	.1437 I .711 P=.086	-.0491 I .711 P=.342	-.5766 I .711 P=.000	-.6172 I .711 P=.000	.3003 I .711 P=.004	.1100 I .711 P=.170	-.4571 I .711 P=.000	.2940 I .711 P=.004
LISN	-.2335 I .711 P=.025	.2574 I .711 P=.015	-.5057 I .711 P=.000	.0015 I .711 P=.495	.3242 I .711 P=.003	.7510 I .711 P=.000	-.0150 I .711 P=.000	.2477 I .711 P=.019	.0002 I .711 P=.000	.1377 I .711 P=.126
IND	.3302 I .711 P=.002	-.5034 I .711 P=.000	.4217 I .711 P=.000	.1014 I .711 P=.065	-.1600 I .711 P=.091	-.6550 I .711 P=.000	.9216 I .711 P=.000	-.4544 I .711 P=.000	-.6121 I .711 P=.000	-.3419 I .711 P=.002
SHL	-.0670 I .711 P=.289	.7674 I .711 P=.000	.1990 I .711 P=.047	-.1162 I .711 P=.167	-.0565 I .711 P=.320	.1793 I .711 P=.047	-.5574 I .711 P=.000	.7673 I .711 P=.000	-.0905 I .711 P=.207	.4507 I .711 P=.000
LRO	-.3604 I .711 P=.001	-.0506 I .711 P=.339	-.6989 I .711 P=.000	-.1224 I .711 P=.155	.2499 I .711 P=.010	.6574 I .711 P=.000	-.6566 I .711 P=.000	-.1100 I .711 P=.101	.0491 I .711 P=.000	.0203 I .711 P=.433
GAM	-.2336 I .711 P=.025	.7497 I .711 P=.000	-.0990 I .711 P=.206	-.1946 I .711 P=.052	-.1027 I .711 P=.044	.1191 I .711 P=.161	-.4093 I .711 P=.000	.0510 I .711 P=.000	-.0597 I .711 P=.311	.4977 I .711 P=.000

ICOEFFICIENT / (CASES) / SIGNIFICANCE)

IA VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)

Table J (continued)

SPSS BATCH SYSTEM

 FILE NONAME (CREATION DATE = 03/31/88)
 SUBFILE CLAS CLAS CLAS CLAS CLAS CLAS CLAS CLAS CLAS

	SPSTACH	TOTMOT	PCTSM	PROSLV	ENOTIME	LSTEN	INDIV	SHALL	LARGE	GAME
COMET	-.2549 I 711 P=.016	.7969 I 711 P=.000	-.1120 I 711 P=.176	-.1740 I 711 P=.073	-.1037 I 711 P=.195	.1403 I 711 P=.122	-.5209 I 711 P=.000	.6352 I 711 P=.000	-.9128 I 711 P=.458	-.8508 I 711 P=.000
OBJLO	.0114 I 711 P=.462	-.4400 I 711 P=.000	-.1285 I 711 P=.143	-.0914 I 711 P=.217	.3286 I 711 P=.003	.4200 I 711 P=.000	.0128 I 711 P=.458	-.4335 I 711 P=.000	.3967 I 711 P=.000	-.2574 I 711 P=.015
QIJSH	.1439 I 711 P=.116	-.0505 I 711 P=.314	.6209 I 711 P=.000	.0950 I 711 P=.215	-.0240 I 711 P=.421	-.0508 I 711 P=.313	.1960 I 711 P=.051	-.0358 I 711 P=.304	-.1891 I 711 P=.057	-.0730 I 711 P=.270
CONLO	-.1222 I 711 P=.155	-.2749 I 711 P=.016	-.3010 I 711 P=.001	-.0585 I 711 P=.314	-.1248 I 711 P=.151	-.5204 I 711 P=.000	.2957 I 711 P=.004	-.3968 I 711 P=.005	-.9417 I 711 P=.348	-.1027 I 711 P=.044
CONSH	.4222 I 711 P=.000	-.1964 I 711 P=.050	.5901 I 711 P=.000	.1734 I 711 P=.074	-.1970 I 711 P=.058	-.4597 I 711 P=.000	.3015 I 711 P=.001	.0210 I 711 P=.431	-.7541 I 711 P=.000	-.3560 I 711 P=.001
ACTLO	-.4675 I 711 P=.000	.4041 I 711 P=.000	-.7049 I 711 P=.000	-.1660 I 711 P=.082	-.2006 I 711 P=.047	.0107 I 711 P=.438	-.3792 I 711 P=.001	.1604 I 711 P=.080	.8726 I 711 P=.011	.0030 I 711 P=.000
ACTSH	.3625 I 711 P=.001	.1074 I 711 P=.106	.9093 I 711 P=.000	.0340 I 711 P=.303	-.0739 I 711 P=.270	-.2066 I 711 P=.042	.3306 I 711 P=.002	.2231 I 711 P=.031	-.9008 I 711 P=.000	-.0390 I 711 P=.372
INSLO	.1794 I 711 P=.067	-.5114 I 711 P=.000	-.3925 I 711 P=.000	.1592 I 711 P=.092	.1177 I 711 P=.164	-.0000 I 711 P=.471	.0441 I 711 P=.357	-.3906 I 711 P=.000	.3200 I 711 P=.003	-.4810 I 711 P=.000
INSSH	.7426 I 711 P=.002	.0606 I 711 P=.205	.9539 I 711 P=.000	-.0218 I 711 P=.420	-.0001 I 711 P=.253	-.2676 I 711 P=.013	.3010 I 711 P=.001	.1931 I 711 P=.057	-.4171 I 711 P=.000	-.0450 I 711 P=.295
GR0	.0034 I 711 P=.489	.4494 I 711 P=.000	.3095 I 711 P=.000	-.0632 I 711 P=.300	.1470 I 711 P=.000	.4151 I 711 P=.000	-.3204 I 711 P=.003	.4973 I 711 P=.000	-.1010 I 711 P=.199	.0524 I 711 P=.017
PATLO	-.4908 I 711 P=.000	.3534 I 711 P=.001	-.7504 I 711 P=.000	-.1274 I 711 P=.144	.0608 I 711 P=.205	.3030 I 711 P=.000	-.5603 I 711 P=.000	.1502 I 711 P=.094	.4069 I 711 P=.000	.4100 I 711 P=.000

(COEFFICIENT / (CASES) / SIGNIFICANCE)

A VALUE OF 99.9999 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED

Table J (continued)

SPSS RATCH SYSTEM

 FILE NONAME (CREATION DATE = 03/31/88)
 SUBFILE CLAI CLAZ CLAT CLAA CLAS CLAB CLAT CLAR CLAG

	PEARSON CORRELATION COEFFICIENTS										PAGE
	SPSTACH	TOTNOT	PCTSMI	PROSLV	ENDTIM	LITSEN	INDIV	SMALL	LARGE		
PATSH	.3402 I .711 P=.002	.0205 I .711 P=.407	.9909 I .711 P=.000	.0701 I .711 P=.291	-.1012 I .711 P=.201	-.2339 I .711 P=.025	.3924 I .711 P=.000	.1504 I .711 P=.105	-.5093 I .711 P=.000	-.0060 I .711 P=.234	
BIAOLO	-.1531 I .711 P=.101	.2766 I .711 P=.010	.0592 I .711 P=.312	-.3670 I .711 P=.001	-.2497 I .711 P=.011	-.3035 I .711 P=.005	.1214 I .711 P=.157	.1255 I .711 P=.149	-.2553 I .711 P=.016	.3779 I .711 P=.001	
BIAOSH	.3373 I .711 P=.002	.0196 I .711 P=.436	.0261 I .711 P=.000	-.0302 I .711 P=.401	.0003 I .711 P=.499	-.2646 I .711 P=.012	.4611 I .711 P=.000	.0977 I .711 P=.369	-.6171 I .711 P=.000	-.0540 I .711 P=.375	
EVALLO	.1346 I .711 P=.132	.3430 I .711 P=.002	-.1376 I .711 P=.126	.1403 I .711 P=.109	-.0079 I .711 P=.474	.3075 I .711 P=.005	-.3127 I .711 P=.004	.3511 I .711 P=.001	.0195 I .711 P=.436	.2427 I .711 P=.001	
EVALSH	.2024 I .711 P=.009	.0349 I .711 P=.306	.3089 I .711 P=.000	.1574 I .711 P=.095	-.1639 I .711 P=.006	-.2334 I .711 P=.025	.3257 I .711 P=.003	.1305 I .711 P=.125	-.0013 I .711 P=.000	-.0313 I .711 P=.390	
ALTMLO	.3464 I .711 P=.002	-.0253 I .711 P=.417	.0410 I .711 P=.365	.3020 I .711 P=.005	-.1019 I .711 P=.404	-.1049 I .711 P=.107	.2341 I .711 P=.025	-.0007 I .711 P=.471	-.2677 I .711 P=.010	.0109 I .711 P=.430	
ALTMSH	.1009 I .711 P=.103	-.1303 I .711 P=.139	.0750 I .711 P=.267	-.0559 I .711 P=.322	.1562 I .711 P=.097	-.1476 I .711 P=.110	.3037 I .711 P=.000	-.1093 I .711 P=.057	-.2551 I .711 P=.016	-.0269 I .711 P=.414	
SPSTACH	1.0000 I .711 P=.	-.0509 I .711 P=.337	.3763 I .711 P=.001	.7257 I .711 P=.000	.3041 I .711 P=.005	-.0430 I .711 P=.361	.2312 I .711 P=.026	-.1016 I .711 P=.200	-.1662 I .711 P=.003	.0601 I .711 P=.309	
TOTNOT	-.0509 I .711 P=.337	1.0000 I .711 P=.	.0350 I .711 P=.306	.0150 I .711 P=.440	-.0290 I .711 P=.403	.0160 I .711 P=.445	-.5506 I .711 P=.000	.0610 I .711 P=.000	-.1930 I .711 P=.053	.0123 I .711 P=.000	
PCTSMI	.3763 I .711 P=.001	.0350 I .711 P=.306	1.0000 I .711 P=.	.0670 I .711 P=.207	-.0976 I .711 P=.209	-.2609 I .711 P=.014	.4045 I .711 P=.000	.1020 I .711 P=.007	-.0149 I .711 P=.000	-.0936 I .711 P=.219	
PROSLV	.7257 I .711 P=.000	.0150 I .711 P=.440	.0670 I .711 P=.207	1.0000 I .711 P=.	.3200 I .711 P=.003	.0401 I .711 P=.345	.0754 I .711 P=.266	-.1154 I .711 P=.169	.0251 I .711 P=.410	.1012 I .711 P=.065	

(COEFFICIENT / (CASES) / SIGNIFICANCE)

A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED

Table J (continued)

SPSS BATCH SYSTEM

FILE NONAME (CREATION DATE = 03/31/80)
SUBFILE CLAI CLAI2 CLAI3 CLAI4 CLAI5 CLAI6 CLAI7 CLAI8 CLAI9

	PEARSON CORRELATION COEFFICIENTS									
	SPSTACH	TOTMOT	PCTSHL	PRMSLV	ENOTIME	LISTEN	INDIV	SMALL	LARGE	GAME
ENOTIME	.3041 (.711) P=.005	-.0298 (.711) P=.403	-.0476 (.711) P=.209	.3200 (.711) P=.003	1.0000 (.711) P=*****	.5372 (.711) P=.000	-.2734 (.711) P=.011	-.0419 (.711) P=.364	.3510 (.711) P=.001	-.0 (.711) P=.
LISTEN	-.0430 (.711) P=.361	.0168 (.711) P=.445	-.2609 (.711) P=.014	.0481 (.711) P=.345	.5372 (.711) P=.000	1.0000 (.711) P=*****	-.6533 (.711) P=.000	.0167 (.711) P=.445	.7235 (.711) P=.000	-.0 (.711) P=.
INDIV	.2312 (.711) P=.026	-.5506 (.711) P=.000	.4045 (.711) P=.000	.0754 (.711) P=.266	-.2734 (.711) P=.011	-.6533 (.711) P=.000	1.0000 (.711) P=*****	-.5511 (.711) P=.000	-.6092 (.711) P=.000	-.3 (.711) P=.
SMALL	-.1016 (.711) P=.200	.8610 (.711) P=.000	.1628 (.711) P=.087	-.1154 (.711) P=.169	-.0419 (.711) P=.364	.0167 (.711) P=.445	-.5511 (.711) P=.000	1.0000 (.711) P=*****	-.3259 (.711) P=.003	.4 (.711) P=.
LARGE	-.1662 (.711) P=.083	-.1930 (.711) P=.053	-.6149 (.711) P=.000	.0251 (.711) P=.418	.3510 (.711) P=.001	.7235 (.711) P=.000	-.6092 (.711) P=.000	-.3259 (.711) P=.003	1.0000 (.711) P=*****	-.0 (.711) P=.
GAME	.0601 (.711) P=.309	.0123 (.711) P=.000	-.0936 (.711) P=.219	.1812 (.711) P=.065	-.0130 (.711) P=.457	-.0022 (.711) P=.493	-.3340 (.711) P=.002	.4116 (.711) P=.000	-.0101 (.711) P=.467	1.00 (.711) P=*****
COMPETE	-.0266 (.711) P=.412	.8867 (.711) P=.000	-.1076 (.711) P=.186	.1050 (.711) P=.192	-.0061 (.711) P=.480	.0248 (.711) P=.419	-.4449 (.711) P=.000	.5369 (.711) P=.000	-.0848 (.711) P=.487	.95 (.711) P=.0

(COEFFICIENT / (CASES) / SIGNIFICANCE)

(A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)

Table J (continued)

SPSS BATCH SYSTEM

FILE NONAME (CREATION DATE = 03/31/89)
SUBFILE CLAI CLAZ CLAS CL44 CL45 CL46 CL47 CL48 CL49

----- PEARSON CORRELATION COEFFICIENTS -----

COMPETE

COMP .1539
1 711
P= .100

PLNSCR -.0786
1 711
P= .257

PPLNSCR -.1069
1 711
P= .082

OBSCLR .0172
1 711
P= .443

SUMATT1 .0374
1 711
P= .394

SUMATT2 .1236
1 711
P= .152

SPERCLR .0592
1 711
P= .312

LSPERCLR .0693
1 711
P= .203

OUTLNS .2036
1 711
P= .044

EXPLNS .4483
1 711
P= .000

REVSX .3991
1 711
P= .000

598

(COEFFICIENT / CASES) / SIGNIFICANCE)

(A VALUE OF 99.9999 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)

Table J (continued)

SPSS BATCH SYSTEM

FILE NONAME (CREATION DATE = 03/31/89)
SUBFILE CL#1 CL#2 CL#3 CL#4 CL#5 CL#6 CL#7 CL#8 CL#9

----- PEARSON CORRELATION COEFFICIENTS -----									
	COMPLETE								
ALTS	-.1160								
	t 711								
	P= .168								
REPOZ	-.3957								
	t 711								
	P= .000								
EMPHIP	-.3813								
	t 711								
	P= .001								
OTHER	-.2445								
	t 711								
	P= .019								
END	-.1854								
	t 711								
	P= .061								
OFTSK	.2194								
	t 711								
	P= .033								
LISH	.2425								
	t 711								
	P= .021								
IND	-.4464								
	t 711								
	P= .000								
SHL	.6277								
	t 711								
	P= .000								
LRO	.0242								
	t 711								
	P= .414								
GAN	.7405								
	t 711								
	P= .000								

(COEFFICIENT / (CASES) / SIGNIFICANCE)

A VALUE OF 99.9999 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED

Table J (continued)

SPSS BATCH SYSTEM

FILE NONAME (CREATION DATE = 03/31/89)

SUBFILE CLAS1 CLAS2 CLAS3 CLAS4 CLAS5 CLAS6 CLAS7 CLAS8 CLAS9

----- PEARSON CORRELATION COEFFICIENTS -----

COMPLETE

COMET .7981
 1 711
 P= .000

ODJL0 -.3769
 1 711
 P= .001

ODJSH -.0564
 1 711
 P= .320

COML0 -.1495
 1 711
 P= .107

CONSH -.3544
 1 711
 P= .001

ACTL0 .5366
 1 711
 P= .000

ACTSH -.0387
 1 711
 P= .384

INSL0 -.4007
 1 711
 P= .000

INSSH -.0814
 1 711
 P= .250

ORG .7932
 1 711
 P= .007

PATL0 .4686
 1 711
 P= .000

600

(COEFFICIENT / (CASES) / SIGNIFICANCE)

(A VALUE OF 99.9999 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)

Table J (continued)

SPSS BATCH SYSTEM

FILE NONAME CREATION DATE = 03/31/88
SUBFILE CLAS1 CLAS2 CLAS3

CLAS4

CLAS5

CLAS6

CLAS7

CLAS8

CLAS9

----- PEARSON CORRELATION COEFFICIENTS -----

COMPLETE

PATSH -.1119
1 711
P= .176

DIAQL0 .3194
1 711
P= .003

DIAQSH -.0702
1 711
P= .280

EVALLO .2346
1 711
P= .024

EVALSH -.1179
1 711
P= .184

ALTNLO -.0815
1 711
P= .258

ALTNSH -.0425
1 711
P= .342

SPSTACH -.0268
1 711
P= .412

TOTNOT .0061
1 711
P= .000

PCTSHL -.1074
1 711
P= .104

PRBSLV .1059
1 711
P= .192

(COEFFICIENT / (CASES) / SIGNIFICANCE)

IF VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED

Table J (continued)

SPSS BATCH SYSTEM

FILE NONAME (CREATION DATE = 03/31/00)
SUBFILE CLA1 CLA2 CLA3 CLA4

CLA5

CLA6

CLA7

CLA8

CLA9

----- PEARSON CORRELATION COEFFICIENTS -----

COMPETE

NOTIME
-.0061
(71)
P= .480ISTEN
.0248
(71)
P= .419NDIV
-.4449
(71)
P= .000HALL
.5369
(71)
P= .000RGE
-.0040
(71)
P= .487HE
.9346
(71)
P= .000MPETE
1.0000
(71)
P= .000

602

COEFFICIENT / (CASES) / SIGNIFICANCE)

(A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)

KEY FOR TABLE K

COMP	= Mathematics competency
PLNSCR	= Raw planning score
PPLNSCR	= Proportional planning score
OBSCLR	= Observed clarity
SUMATT1	= Preinstructional attitude
SUMATT2	= Postinstructional attitude
SPERCLR	= Perceived clarity (all items)
LSPERCLR	= Perceived clarity (16 items)
OUTLNS	= Outlines objectives
EXPLNS	= Explains what to do next
REVSM	= Reviews/summarizes
RLTS	= Relates content
REPQE	= Repeats questions/explanation
EMPHIP	= Emphasizes important points
OTHER	= Other
ENG	= Mean class engagement
OFTSK	= Mean class off-task
LSN	= Mean class listening
IND	= Mean class individual grouping
SML	= Mean class small grouping
LRG	= Mean class large grouping
GAM	= Mean class games use
COMET	= Mean class competition

KEY FOR TABLE K (continued)

OBJLG	= Objectives (large)
OBJSM	= Objectives (small)
CONLG	= Content (large)
CONSM	= Content (small)
ACTLG	= Activities (large)
ACTSM	= Activities (small)
INSLG	= Instruction (large)
INSSM	= Instruction (small)
ORG	= Organization
MATLG	= Materials (large)
MATSM	= Materials (small)
DIAGLG	= Diagnosis (large)
DIAGSM	= Diagnosis (small)
EVALLG	= Evaluation (large)
EVALSM	= Evaluation (small)
ALTNLG	= Alternative procedure (large)
ALTNSM	= Alternative procedure (small)
SPSTACH	= Postachievement
TOTMOT	= Motivation strategy use
PCTSM	= Percent individual/small grouping planning statements
PRBSLV	= Problem solving ability

Table K

Pearson Correlations for All Students

SPSS BATCH SYSTEM

FILE	NONAME	CREATION DATE	03/31/89							
SUBFILE	CLA1	CLA2	CLA3	CLA4	CLA5	CLA6	CLA7	CLA8	CLA9	
----- PEARSON CORRELATION COEFFICIENTS -----										
COMP	PLNSCH	PPLNSCH	OBSCLN	SUMATT1	SUMATT2	SPENCLN	LSPENCLN	OUTLNS	EXPLNS	
1.0000	.0036	.0609	-.0007	.3291	.3200	.3050	.3125	.4000	.0627	
(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	
P= .000	P= .481	P= .203	P= .453	P= .000	P= .000	P= .000	P= .000	P= .002	P= .236	
PLNSCH	1.0000	.0529	.1637	-.0563	-.0595	.0957	.0040	.0509	-.1411	
(100)	(209)	(209)	(209)	(209)	(209)	(209)	(209)	(209)	(209)	
P= .481	P= .000	P= .000	P= .009	P= .201	P= .196	P= .084	P= .113	P= .232	P= .021	
PPLNSCH	.0609	1.0000	.1496	.0195	.0155	.1240	.0070	.0673	-.1962	
(100)	(209)	(209)	(209)	(209)	(209)	(209)	(209)	(209)	(209)	
P= .203	P= .000	P= .000	P= .015	P= .309	P= .412	P= .037	P= .105	P= .167	P= .002	
OBSCLN	-.0007	.1637	.1496	1.0000	.1041	.0221	-.1325	-.0270	.0315	.7914
(100)	(209)	(209)	(209)	(209)	(209)	(209)	(209)	(209)	(209)	
P= .453	P= .009	P= .015	P= .000	P= .067	P= .375	P= .020	P= .345	P= .000	P= .000	
SUMATT1	.3291	-.0563	.0195	.1041	1.0000	.7303	.3401	.2907	.0849	.0524
(100)	(209)	(209)	(209)	(209)	(209)	(209)	(209)	(209)	(209)	
P= .000	P= .201	P= .309	P= .067	P= .000	P= .000	P= .000	P= .000	P= .105	P= .226	
SUMATT2	.3200	-.0595	.0155	.0221	.7303	1.0000	.4245	.3152	-.0433	-.0440
(100)	(209)	(209)	(209)	(209)	(209)	(209)	(209)	(209)	(209)	
P= .000	P= .196	P= .412	P= .375	P= .000	P= .000	P= .000	P= .000	P= .000	P= .267	P= .263
SPENCLN	.3050	.0957	.1240	-.1325	.3401	.4245	1.0000	.0070	-.0334	-.1000
(100)	(209)	(209)	(209)	(209)	(209)	(209)	(209)	(209)	(209)	
P= .000	P= .084	P= .037	P= .020	P= .000	P= .000	P= .000	P= .000	P= .000	P= .316	P= .000
LSPENCLN	.3125	.0040	.0070	-.0270	.2907	.3152	.0070	1.0000	-.0061	-.0011
(100)	(209)	(209)	(209)	(209)	(209)	(209)	(209)	(209)	(209)	
P= .000	P= .113	P= .105	P= .345	P= .000	P= .000	P= .000	P= .000	P= .000	P= .466	P= .494
OUTLNS	.4000	.0509	.0673	.0315	.0849	-.0433	-.0334	-.0061	1.0000	.0030
(100)	(209)	(209)	(209)	(209)	(209)	(209)	(209)	(209)	(209)	
P= .002	P= .232	P= .167	P= .000	P= .105	P= .267	P= .316	P= .466	P= .000	P= .000	
EXPLNS	.0627	-.1411	-.1962	.7914	.0524	-.0440	-.1000	-.0011	.0030	1.0000
(100)	(209)	(209)	(209)	(209)	(209)	(209)	(209)	(209)	(209)	
P= .236	P= .021	P= .002	P= .000	P= .226	P= .263	P= .000	P= .466	P= .000	P= .000	P= .000
ALVSN	-.0056	-.0174	-.3500	.0400	-.0047	-.1002	-.0037	.0040	.0062	.0017
(100)	(209)	(209)	(209)	(209)	(209)	(209)	(209)	(209)	(209)	
P= .470	P= .001	P= .000	P= .000	P= .473	P= .059	P= .000	P= .365	P= .000	P= .000	P= .000

(COEFFICIENT / (CASES) / SIGNIFICANCE)

(A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)

Table K (continued)

SPSS BATCH SYSTEM

FILE MONAME (CREATION DATE = 03/31/88)

SUBFILE CLAS1 CLAS2 CLAS3 CLAS4 CLAS5 CLAS6 CLAS7 CLAS8 CLAS9

	PEARSON CORRELATION COEFFICIENTS									
	COMP	PLNSCH	PPLNSCH	USUSCH	SUNATT1	SUNATT2	SPENCLR	LSPENCLR	OUTLNS	EXPLNS
ALTS	-.1282 (.100) P=.043	-.1633 (.100) P=.000	-.4101 (.100) P=.000	.7420 (.100) P=.000	.1140 (.100) P=.049	.0451 (.100) P=.258	-.1930 (.100) P=.003	-.0957 (.100) P=.004	.0146 (.100) P=.000	.0021 (.100) P=.000
REPOE	-.1007 (.100) P=.074	-.0923 (.100) P=.092	-.0132 (.100) P=.425	.0637 (.100) P=.000	.1190 (.100) P=.042	.1402 (.100) P=.016	-.1784 (.100) P=.005	-.1316 (.100) P=.029	-.0067 (.100) P=.106	.0777 (.100) P=.132
ENPHJP	.2934 (.100) P=.000	-.2107 (.100) P=.001	.0570 (.100) P=.204	.0672 (.100) P=.167	.2453 (.100) P=.000	.1099 (.100) P=.002	.0721 (.100) P=.150	-.0000 (.100) P=.405	.3640 (.100) P=.000	.0297 (.100) P=.335
OTHER	-.0156 (.100) P=.416	.2350 (.100) P=.000	.2900 (.100) P=.000	-.0694 (.100) P=.000	-.0030 (.100) P=.116	.0202 (.100) P=.306	.1395 (.100) P=.022	.0260 (.100) P=.360	-.7133 (.100) P=.000	-.0004 (.100) P=.000
END	-.0431 (.100) P=.155	-.1277 (.100) P=.033	-.2572 (.100) P=.000	.0000 (.100) P=.000	-.0010 (.100) P=.120	-.1266 (.100) P=.034	-.1725 (.100) P=.006	-.0000 (.100) P=.200	.0000 (.100) P=.000	.0000 (.100) P=.000
OFTSX	.0393 (.100) P=.296	.1061 (.100) P=.063	.2325 (.100) P=.000	-.4492 (.100) P=.000	.0781 (.100) P=.130	.1272 (.100) P=.033	.1690 (.100) P=.011	.0472 (.100) P=.249	-.0421 (.100) P=.000	-.0704 (.100) P=.000
LISH	.0630 (.100) P=.192	-.4676 (.100) P=.000	-.5477 (.100) P=.000	.0101 (.100) P=.000	.0543 (.100) P=.269	-.0524 (.100) P=.226	-.1192 (.100) P=.043	-.0100 (.100) P=.394	.0719 (.100) P=.000	.0003 (.100) P=.000
IND	.0724 (.100) P=.162	.2594 (.100) P=.000	.4063 (.100) P=.000	-.6222 (.100) P=.000	-.0325 (.100) P=.326	.0614 (.100) P=.189	.1171 (.100) P=.046	.0019 (.100) P=.489	-.0473 (.100) P=.000	-.0000 (.100) P=.000
SML	.0210 (.100) P=.303	.1011 (.100) P=.004	.0429 (.100) P=.269	.1344 (.100) P=.026	-.0481 (.100) P=.259	-.0917 (.100) P=.093	.0009 (.100) P=.122	.1064 (.100) P=.013	.4704 (.100) P=.000	.0112 (.100) P=.000
LRO	-.1113 (.100) P=.064	-.0710 (.100) P=.000	-.0112 (.100) P=.000	.0456 (.100) P=.000	.0792 (.100) P=.127	.0043 (.100) P=.476	-.0122 (.100) P=.001	-.1340 (.100) P=.026	.4307 (.100) P=.000	.0107 (.100) P=.000
QAM	.0305 (.100) P=.295	.0024 (.100) P=.110	.0275 (.100) P=.346	.2100 (.100) P=.001	-.0771 (.100) P=.134	-.0929 (.100) P=.090	.0007 (.100) P=.450	.0010 (.100) P=.179	.4925 (.100) P=.000	.0004 (.100) P=.000

ICOEFFICIENT / (CASES) / SIGNIF (CASES)

A VALUE OF .99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED

Table K (continued)

SPSS BATCH SYSTEM

FILE NOHAME (CMULATION DATE = 03/31/80)

SUBFILE CLAS1 CLAS2 CLAS3 CLAS4 CLAS5 CLAS6 CLAS7 CLAS8 CLAS9

	P E A R S O N C O R R E L A T I O N C O E F F I C I E N T S										
	COMP	PLNSCH	PPLNSCH	UNSLCH	SUMATT1	SUMATT2	SPIRCLH	LSPINCLH	OUTLNS	EXPLNS	
COMET	.0055 1 .001 P=.470	.0394 1 .001 P=.285	-.1045 1 .001 P=.066	.1152 1 .001 P=.648	-.1421 1 .001 P=.020	-.1619 1 .001 P=.010	.0001 1 .001 P=.454	.0704 1 .001 P=.130	.4062 1 .001 P=.000	.5954 1 .001 P=.000	
OBJLG	-.1027 1 .001 P=.080	.0577 1 .001 P=.303	.1002 1 .001 P=.050	.0329 1 .001 P=.000	.0542 1 .001 P=.218	.0216 1 .001 P=.370	-.1515 1 .001 P=.014	-.1240 1 .001 P=.037	.1959 1 .001 P=.002	.1944 1 .001 P=.002	
OBJSH	-.0149 1 .001 P=.409	.0916 1 .001 P=.000	.5639 1 .001 P=.000	.0083 1 .001 P=.664	-.1279 1 .001 P=.032	-.1254 1 .001 P=.035	-.0103 1 .001 P=.441	-.0401 1 .001 P=.282	.1409 1 .001 P=.015	-.1704 1 .001 P=.007	
CONLG	-.1701 1 .001 P=.007	-.4023 1 .001 P=.000	-.4472 1 .001 P=.000	-.7062 1 .001 P=.000	-.1224 1 .001 P=.039	-.0413 1 .001 P=.276	-.0030 1 .001 P=.478	-.0517 1 .001 P=.229	-.7879 1 .001 P=.000	-.6091 1 .001 P=.000	
CONSH	.0492 1 .001 P=.291	.2966 1 .001 P=.000	.3626 1 .001 P=.000	-.5036 1 .001 P=.000	.1070 1 .001 P=.062	.1000 1 .001 P=.060	.2097 1 .001 P=.001	.1191 1 .001 P=.043	-.4830 1 .001 P=.000	-.7022 1 .001 P=.000	
ACTLG	-.0509 1 .001 P=.244	-.4956 1 .001 P=.000	-.7347 1 .001 P=.000	-.0627 1 .001 P=.224	-.0591 1 .001 P=.198	-.0350 1 .001 P=.303	-.1162 1 .001 P=.047	-.0740 1 .001 P=.143	.4144 1 .001 P=.001	.4579 1 .001 P=.000	
ACTSH	.0241 1 .001 P=.301	.9526 1 .001 P=.000	.9176 1 .001 P=.000	-.0503 1 .001 P=.201	-.0502 1 .001 P=.235	-.0354 1 .001 P=.305	.1510 1 .001 P=.014	.1261 1 .001 P=.034	-.0916 1 .001 P=.094	-.2602 1 .001 P=.000	
INSLG	.0152 1 .001 P=.410	-.4907 1 .001 P=.000	-.4344 1 .001 P=.000	-.2147 1 .001 P=.001	.1112 1 .001 P=.055	.0620 1 .001 P=.227	.0016 1 .001 P=.491	-.0502 1 .001 P=.201	-.1465 1 .001 P=.017	-.2050 1 .001 P=.000	
INSSH	-.0236 1 .001 P=.374	.0974 1 .001 P=.000	.0094 1 .001 P=.000	-.0796 1 .001 P=.126	-.0292 1 .001 P=.337	.0050 1 .001 P=.471	.1541 1 .001 P=.013	.1341 1 .001 P=.026	-.4784 1 .001 P=.000	-.3540 1 .001 P=.000	
ORG	.0770 1 .001 P=.147	.3944 1 .001 P=.000	.3650 1 .001 P=.000	.5772 1 .001 P=.000	.0209 1 .001 P=.319	.0012 1 .001 P=.443	.0270 1 .001 P=.345	.1279 1 .001 P=.032	.2052 1 .001 P=.000	.6230 1 .001 P=.000	
PATLG	-.0102 1 .001 P=.445	-.6178 1 .001 P=.000	-.6701 1 .001 P=.000	.3612 1 .001 P=.000	-.0493 1 .001 P=.219	-.0500 1 .001 P=.202	-.1707 1 .001 P=.007	-.0766 1 .001 P=.135	.7339 1 .001 P=.000	.7352 1 .001 P=.000	

(COEFFICIENT / CLAS6) / SIGNIFICANCE)

(A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)

Table K (continued)

SPSS MATCH SYSTEM

FILE NONAME (CREATION DATE = 03/31/88)
SUBFILE CLAI CLAS CLAS CLAS CLAS CLAS CLAS CLAS

	PEARSON CORRELATION COEFFICIENTS									
	COMP	PLNSCH	PPLNSCH	UNSLCH	SUMATT1	SUMATT2	SPLNCLR	LSPNCLR	OUTLNS	EXPLNS
PATSH	.0389 (100) P=.098	.9051 (209) P=.000	.0900 (209) P=.000	-.0075 (209) P=.104	-.0140 (209) P=.409	.0135 (209) P=.423	.1405 (209) P=.021	.1072 (209) P=.061	-.1372 (209) P=.024	-.3392 (209) P=.000
DIAGLO	-.2550 (100) P=.000	.2031 (209) P=.000	.3005 (209) P=.000	-.0241 (209) P=.354	-.0671 (209) P=.167	.0105 (209) P=.440	.0052 (209) P=.470	.0142 (209) P=.419	-.2908 (209) P=.000	-.1373 (209) P=.024
DIAGSH	-.0147 (100) P=.410	.0377 (209) P=.000	.0361 (209) P=.000	-.0936 (209) P=.089	-.1071 (209) P=.061	-.0605 (209) P=.192	.1328 (209) P=.028	.1122 (209) P=.053	-.0724 (209) P=.000	-.3447 (209) P=.000
EVALLO	.2055 (100) P=.000	-.1091 (209) P=.003	-.0459 (209) P=.255	.2243 (209) P=.001	.1726 (209) P=.006	.0913 (209) P=.094	.0975 (209) P=.088	.1025 (209) P=.070	.4371 (209) P=.000	.6509 (209) P=.000
EVALSH	.2197 (100) P=.001	.1415 (209) P=.021	.3420 (209) P=.000	-.2177 (209) P=.001	.1694 (209) P=.007	.1930 (209) P=.003	.1045 (209) P=.004	.1407 (209) P=.021	-.0940 (209) P=.003	-.1940 (209) P=.002
ALTNLO	.3312 (100) P=.000	-.0927 (209) P=.091	.1347 (209) P=.024	-.1800 (209) P=.005	.1733 (209) P=.006	.1313 (209) P=.029	.1462 (209) P=.017	.0593 (209) P=.197	.3922 (209) P=.000	.0129 (209) P=.424
ALTNSH	-.0241 (100) P=.351	.2406 (209) P=.000	.2449 (209) P=.000	-.0769 (209) P=.134	-.1951 (209) P=.002	-.1395 (209) P=.022	.0050 (209) P=.466	-.0030 (209) P=.483	-.1982 (209) P=.002	-.1916 (209) P=.003
SPSTACH	.6263 (100) P=.000	.1799 (209) P=.005	.2919 (209) P=.000	-.1946 (209) P=.002	.3050 (209) P=.000	.3134 (209) P=.000	.4283 (209) P=.000	.3064 (209) P=.000	.0662 (209) P=.209	-.2370 (209) P=.000
TOTMOT	.0219 (100) P=.383	.1609 (209) P=.031	-.0006 (209) P=.497	.1510 (209) P=.014	-.0016 (209) P=.120	-.1104 (209) P=.047	.0491 (209) P=.240	.1214 (209) P=.040	.3657 (209) P=.000	.0050 (209) P=.000
PCTSHL	.0379 (100) P=.303	.9221 (209) P=.000	.9104 (209) P=.000	-.1301 (209) P=.030	-.0298 (209) P=.334	-.0047 (209) P=.473	.1576 (209) P=.011	.1191 (209) P=.043	-.1509 (209) P=.011	-.3670 (209) P=.000
PRBSLV	.0051 (100) P=.000	-.1997 (209) P=.002	-.1311 (209) P=.029	-.1077 (209) P=.003	.1045 (209) P=.004	.1074 (209) P=.003	.3205 (209) P=.000	.3240 (209) P=.001	.4027 (209) P=.002	-.0334 (209) P=.310

(COEFFICIENT / (CASES) / SIGNIFICANCE)

A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED

609

Table K (continued)

SPSS MATCH SYSTEM

FILE NO NAME (CREATION DATE = 93/31/80)
SUBFILE CLAS1 CLAS2 CLAS3

	CLAS4	CLAS5	CLAS6	CLAS7	CLAS8	CLAS9
CORRELATION COEFFICIENTS						
REVSH	RLIS	REPUK	EMPHIP	OTHER	ENH	ORTSK
LISN	INU	SML				
COMP	-.0056 I .100 P=.470	-.1252 I .100 P=.043	-.1607 I .100 P=.014	.2934 I .100 P=.000	-.0156 I .100 P=.416	-.0631 I .100 P=.195
PLNSCH	-.2174 I .209 P=.001	-.3633 I .209 P=.000	-.0923 I .209 P=.092	-.2187 I .209 P=.001	.2358 I .209 P=.000	-.1277 I .209 P=.033
PPLNSCH	-.3508 I .209 P=.000	-.4101 I .209 P=.000	-.0132 I .209 P=.425	.0570 I .209 P=.200	.2900 I .209 P=.000	-.2572 I .209 P=.000
OBSCLE	.0406 I .209 P=.000	.7420 I .209 P=.000	.5537 I .209 P=.000	.0672 I .209 P=.167	-.0594 I .209 P=.000	.6600 I .209 P=.000
SUMATT1	-.0047 I .209 P=.473	.1148 I .209 P=.049	.1198 I .209 P=.042	.2493 I .209 P=.000	-.0830 I .209 P=.116	-.0015 I .209 P=.120
SUMATT2	-.1002 I .209 P=.059	.0451 I .209 P=.250	.1402 I .209 P=.016	.1999 I .209 P=.002	.0202 I .209 P=.386	-.1266 I .209 P=.034
SPENCLR	-.0937 I .209 P=.000	-.1938 I .209 P=.003	-.1704 I .209 P=.005	.0721 I .209 P=.150	-.1395 I .209 P=.022	-.1745 I .209 P=.006
LSPENCLR	.0240 I .209 P=.345	-.0957 I .209 P=.084	-.1316 I .209 P=.049	-.0009 I .209 P=.495	.0250 I .209 P=.360	-.0505 I .209 P=.280
OUTLNS	.0062 I .209 P=.000	.3166 I .209 P=.000	-.0967 I .209 P=.106	.3648 I .209 P=.000	-.7133 I .209 P=.000	.2409 I .209 P=.000
EXPLNS	.0917 I .209 P=.000	.5021 I .209 P=.000	.0777 I .209 P=.132	.0297 I .209 P=.335	-.9506 I .209 P=.000	.4968 I .209 P=.000
REVSH	1.0000 I .209 P=0.0000	.6292 I .209 P=.000	-.0715 I .209 P=.152	-.2705 I .209 P=.000	-.9027 I .209 P=.000	.6209 I .209 P=.000

(COEFFICIENT / (CASES) / SIGNIFICANCE)

A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED

Table K (continued)

SPSS BATCH SYSTEM

 FILE NO NAME (CREATION DATE = 03/31/89)
 SUBFILE CLAI CLAI2 CLAI3 CLAI4 CLAI5 CLAI6 CLAI7 CLAI8 CLAI9

	PEARSON CORRELATION COEFFICIENTS									
	HEVSH	HLTS	HEPOF	ENPHIP	OTHER	ENG	OTISK	LISH	IND	SML
ALTS	.6292 (209) P=.000	1.0000 (209) P=*****	.6609 (209) P=.000	-.0531 (209) P=.223	-.7970 (209) P=.000	.7619 (209) P=.000	-.7403 (209) P=.000	.7227 (209) P=.000	-.6923 (209) P=.000	-.1196 (209) P=.642
REPOE	-.0715 (209) P=.152	.6609 (209) P=.000	1.0000 (209) P=*****	.1791 (209) P=.005	-.2042 (209) P=.000	.4557 (209) P=.000	-.4360 (209) P=.000	.0503 (209) P=.301	-.0992 (209) P=.444	-.6016 (209) P=.000
ENPHIP	-.2705 (209) P=.000	-.0531 (209) P=.223	.1791 (209) P=.005	1.0000 (209) P=*****	-.0154 (209) P=.412	-.3025 (209) P=.000	.2026 (209) P=.000	.0030 (209) P=.403	.3071 (209) P=.000	-.4010 (209) P=.000
OTHER	-.9027 (209) P=.000	-.7970 (209) P=.000	-.2042 (209) P=.000	-.0154 (209) P=.412	1.0000 (209) P=*****	-.6737 (209) P=.000	.0563 (209) P=.000	-.9451 (209) P=.000	.0030 (209) P=.000	-.3353 (209) P=.000
ENG	.6209 (209) P=.000	.7619 (209) P=.000	.4557 (209) P=.000	-.3025 (209) P=.000	-.6737 (209) P=.000	1.0000 (209) P=*****	-.0975 (209) P=.000	.6092 (209) P=.000	-.6270 (209) P=.000	-.0030 (209) P=.102
OTISK	-.6155 (209) P=.000	-.7403 (209) P=.000	-.4360 (209) P=.000	.2026 (209) P=.000	.6563 (209) P=.000	-.9975 (209) P=.000	1.0000 (209) P=*****	-.5975 (209) P=.000	.0045 (209) P=.000	.0022 (209) P=.105
LISH	.9222 (209) P=.000	.7227 (209) P=.000	.0503 (209) P=.201	.0030 (209) P=.403	-.9251 (209) P=.000	.6092 (209) P=.000	-.5975 (209) P=.000	1.0000 (209) P=*****	-.9031 (209) P=.000	.3730 (209) P=.000
IND	-.0556 (209) P=.000	-.6923 (209) P=.000	-.0092 (209) P=.440	.3071 (209) P=.000	.0030 (209) P=.000	-.5270 (209) P=.000	.0045 (209) P=.000	-.9031 (209) P=.000	1.0000 (209) P=*****	-.0059 (209) P=.000
SML	.6044 (209) P=.000	-.1196 (209) P=.642	-.6016 (209) P=.000	-.4010 (209) P=.000	-.3353 (209) P=.000	-.0030 (209) P=.102	.0622 (209) P=.105	.3730 (209) P=.000	-.0059 (209) P=.000	1.0000 (209) P=*****
LRO	.6473 (209) P=.000	.9465 (209) P=.000	.5207 (209) P=.000	-.0207 (209) P=.340	-.7906 (209) P=.000	.6905 (209) P=.000	-.6694 (209) P=.000	.7010 (209) P=.000	-.7175 (209) P=.000	-.1441 (209) P=.019
GAM	.5044 (209) P=.000	-.1901 (209) P=.000	-.6674 (209) P=.000	-.1150 (209) P=.049	-.3071 (209) P=.000	-.1108 (209) P=.044	.1391 (209) P=.022	.3596 (209) P=.000	-.4517 (209) P=.000	.7757 (209) P=.000

(COEFFICIENT / (CASES) / SIGNIF / RANDED)

(A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)

Table K (continued)

Table K (continued)

SPSS BATCH SYSTEM

FILE MONAME (CREATION DATE = 03/31/88)
SUBFILE CLAS1 CLAS2 CLAS3 CLAS4 CLAS5 CLAS6 CLAS7 CLAS8 CLAS9

	CORRELATION COEFFICIENTS									
	MEVSH	RLTS	REPUE	LNPHIP	OTHER	ENG	OTFSK	LISH	IMU	SHL
PATSH	-.6480 I 2091 P=.000	-.6550 I 2091 P=.000	-.1406 I 2091 P=.010	-.0955 I 2091 P=.084	.4636 I 2091 P=.000	-.4282 I 2091 P=.000	.4005 I 2091 P=.000	-.6314 I 2091 P=.000	.4300 I 2091 P=.000	.1754 I 2091 P=.000
DIAQLG	-.1440 I 2091 P=.019	-.2100 I 2091 P=.001	.0741 I 2091 P=.143	-.3410 I 2091 P=.000	.1873 I 2091 P=.003	-.1420 I 2091 P=.020	.1757 I 2091 P=.005	-.4053 I 2091 P=.000	.1657 I 2091 P=.000	.1252 I 2091 P=.035
DIAQSH	-.3671 I 2091 P=.000	-.5672 I 2091 P=.000	-.1701 I 2091 P=.007	-.2354 I 2091 P=.000	.4452 I 2091 P=.000	-.1925 I 2091 P=.003	.1721 I 2091 P=.004	-.6543 I 2091 P=.000	.4070 I 2091 P=.000	.1364 I 2091 P=.024
EVALLG	.3205 I 2091 P=.000	-.0794 I 2091 P=.127	-.2959 I 2091 P=.000	.6305 I 2091 P=.000	-.3940 I 2091 P=.000	-.2300 I 2091 P=.000	.2216 I 2091 P=.001	.4291 I 2091 P=.000	-.4613 I 2091 P=.000	.4308 I 2091 P=.000
EVALSH	-.4209 I 2091 P=.000	-.6260 I 2091 P=.000	-.1530 I 2091 P=.014	.5765 I 2091 P=.000	.3310 I 2091 P=.000	-.6406 I 2091 P=.000	.6170 I 2091 P=.000	-.3703 I 2091 P=.000	.4331 I 2091 P=.000	.1364 I 2091 P=.024
ALTHLG	-.2761 I 2091 P=.000	-.4294 I 2091 P=.000	-.2077 I 2091 P=.000	.8679 I 2091 P=.000	.1403 I 2091 P=.021	-.5863 I 2091 P=.000	.5624 I 2091 P=.000	-.0703 I 2091 P=.130	.3194 I 2091 P=.000	-.0471 I 2091 P=.249
ALTHSH	-.1750 I 2091 P=.005	-.2910 I 2091 P=.000	-.0190 I 2091 P=.391	-.1377 I 2091 P=.023	.2140 I 2091 P=.001	.2169 I 2091 P=.001	-.2172 I 2091 P=.001	-.3299 I 2091 P=.000	.4012 I 2091 P=.000	-.2007 I 2091 P=.002
SPSTACH	-.2694 I 2091 P=.000	-.3150 I 2091 P=.000	-.2191 I 2091 P=.001	.3595 I 2091 P=.000	.2634 I 2091 P=.000	-.2970 I 2091 P=.000	.2677 I 2091 P=.000	-.2476 I 2091 P=.000	.3347 I 2091 P=.000	-.0909 I 2091 P=.077
TOTMUT	.6159 I 2091 P=.000	-.1501 I 2091 P=.015	-.6033 I 2091 P=.000	-.3554 I 2091 P=.000	-.3725 I 2091 P=.000	-.0587 I 2091 P=.199	.0670 I 2091 P=.148	.4039 I 2091 P=.000	-.3706 I 2091 P=.000	.0674 I 2091 P=.000
PCTSHL	-.4395 I 2091 P=.000	-.5944 I 2091 P=.000	-.2101 I 2091 P=.000	-.1353 I 2091 P=.020	.4925 I 2091 P=.000	-.4271 I 2091 P=.000	.3980 I 2091 P=.000	-.6523 I 2091 P=.000	.4439 I 2091 P=.000	.1990 I 2091 P=.002
PHBSLV	-.0950 I 2091 P=.004	-.1619 I 2091 P=.010	-.2121 I 2091 P=.001	.4040 I 2091 P=.000	.0735 I 2091 P=.145	-.1740 I 2091 P=.000	.1499 I 2091 P=.015	.0713 I 2091 P=.152	.1294 I 2091 P=.021	-.0960 I 2091 P=.002

(COEFFICIENT / (CASES) / SIGNIFICANCE)

(A VALUE OF .99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)

Table K (continued)

SPSS BATCH SYSTEM

FILE NONAME (CREATION DATE = 03/31/80)

SUBFILE	CLAS1	CLAS2	CLAS3	CLAS4	CLAS5	CLAS6	CLAS7	CLAS8	CLAS9	
----- PEARSON CORRELATION COEFFICIENTS -----										
	LNH	QAH	COMET	UNJLO	ORJSH	CONLG	CUNSH	ACTLG	ALJSH	INSLG
COMP	-.1113 (100) P=.064	.0295 (100) P=.295	.0055 (100) P=.470	-.1027 (100) P=.080	-.0169 (100) P=.409	-.1701 (100) P=.007	.0492 (100) P=.251	-.0509 (100) P=.244	.0261 (100) P=.301	.0152 (100) P=.418
PLNSCH	-.4710 (209) P=.000	.0024 (209) P=.110	.0394 (209) P=.205	.0577 (209) P=.203	.4916 (209) P=.000	-.4023 (209) P=.000	.2966 (209) P=.000	-.6956 (209) P=.000	.9520 (209) P=.000	-.4987 (209) P=.000
PPLNSCH	-.5312 (209) P=.000	.0275 (209) P=.346	-.1045 (209) P=.044	.1002 (209) P=.050	.5639 (209) P=.000	-.4472 (209) P=.000	.3426 (209) P=.000	-.7347 (209) P=.000	.9176 (209) P=.000	-.4344 (209) P=.000
QUSCLR	.6453 (209) P=.000	.2140 (209) P=.001	.1152 (209) P=.040	.6329 (209) P=.000	.0963 (209) P=.444	-.7062 (209) P=.000	-.5034 (209) P=.000	-.0527 (209) P=.224	-.0503 (209) P=.201	-.2147 (209) P=.001
SUMATT1	.0792 (209) P=.127	-.0771 (209) P=.134	-.1421 (209) P=.020	.0542 (209) P=.218	-.1279 (209) P=.032	-.1224 (209) P=.039	.1070 (209) P=.043	-.0591 (209) P=.198	-.0502 (209) P=.236	.1112 (209) P=.055
SUMATT2	.0043 (209) P=.476	-.0929 (209) P=.050	-.1019 (209) P=.010	.0216 (209) P=.378	-.1294 (209) P=.035	-.0413 (209) P=.276	.1000 (209) P=.060	-.0350 (209) P=.303	-.0344 (209) P=.305	.0520 (209) P=.227
SPEMCLH	-.2122 (209) P=.001	.0007 (209) P=.450	.0001 (209) P=.404	-.1510 (209) P=.014	-.0103 (209) P=.441	-.0030 (209) P=.970	.2097 (209) P=.001	-.1162 (209) P=.047	.1510 (209) P=.014	.0016 (209) P=.491
LSPMCLH	-.1340 (209) P=.026	.0639 (209) P=.179	.0764 (209) P=.120	-.1240 (209) P=.037	-.0401 (209) P=.202	-.0517 (209) P=.220	.1191 (209) P=.043	-.0740 (209) P=.143	.1261 (209) P=.034	-.0502 (209) P=.201
OUTLNS	.4307 (209) P=.000	.4925 (209) P=.000	.3052 (209) P=.000	.1959 (209) P=.002	.1499 (209) P=.010	.1079 (209) P=.080	-.4030 (209) P=.000	.2146 (209) P=.001	-.0916 (209) P=.074	-.1455 (209) P=.017
EXPLNS	.6107 (209) P=.000	.0408 (209) P=.000	.0004 (209) P=.000	.1966 (209) P=.002	-.1704 (209) P=.007	-.6091 (209) P=.000	-.7022 (209) P=.000	.4579 (209) P=.000	-.4602 (209) P=.000	-.2950 (209) P=.000
REVMH	.6473 (209) P=.000	.8044 (209) P=.000	.6160 (209) P=.000	.1260 (209) P=.034	-.2103 (209) P=.001	-.3009 (209) P=.000	-.5508 (209) P=.000	.4047 (209) P=.000	-.2204 (209) P=.000	-.0731 (209) P=.147

(COEFFICIENT / CASES) / SIGNIFICANCE)

A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED

Table K (continued)

SPSS BATCH SYSTEM

FILE: HDNAME CREATION DATE: 03/31/90

SUBFILE: CLAS1 CLAS2 CLAS3 CLAS4 CLAS5 CLAS6 CLAS7 CLAS8 CLAS9

	PEARSON CORRELATION COEFFICIENTS									
	LNU	GAN	CONET	UNJLG	ONJSH	CONLU	CONSH	ACTLG	ACTSH	INSLO
RLTS	.9445 1 .2091 P=.000	-.1981 1 .2091 P=.003	-.1562 1 .2091 P=.012	.6428 1 .2091 P=.000	-.2309 1 .2091 P=.000	-.1597 1 .2091 P=.010	-.4004 1 .2091 P=.000	.1219 1 .2091 P=.039	-.5595 1 .2091 P=.000	.3282 1 .2091 P=.000
RLPGZ	.6287 1 .2091 P=.000	-.4474 1 .2091 P=.000	-.6037 1 .2091 P=.000	.7648 1 .2091 P=.000	-.1030 1 .2091 P=.069	-.0844 1 .2091 P=.112	-.3140 1 .2091 P=.000	-.1947 1 .2091 P=.002	-.4720 1 .2091 P=.000	.1341 1 .2091 P=.026
ENPHIP	-.0287 1 .2091 P=.340	-.1159 1 .2091 P=.049	-.3794 1 .2091 P=.000	.1206 1 .2091 P=.041	-.2610 1 .2091 P=.000	-.3479 1 .2091 P=.000	.0271 1 .2091 P=.348	-.0232 1 .2091 P=.369	-.4117 1 .2091 P=.001	.1926 1 .2091 P=.003
OTHER	-.7984 1 .2091 P=.000	-.3071 1 .2091 P=.000	-.3732 1 .2091 P=.000	-.3947 1 .2091 P=.000	.2377 1 .2091 P=.000	.5599 1 .2091 P=.000	.6844 1 .2091 P=.000	-.3463 1 .2091 P=.000	.4027 1 .2091 P=.000	.0669 1 .2091 P=.166
END	.6786 1 .2091 P=.000	-.1185 1 .2091 P=.044	.0019 1 .2091 P=.409	.6407 1 .2091 P=.000	-.0001 1 .2091 P=.125	-.0733 1 .2091 P=.146	-.6149 1 .2091 P=.000	-.0345 1 .2091 P=.310	-.4512 1 .2091 P=.000	.1547 1 .2091 P=.010
OFFSH	-.6694 1 .2091 P=.000	.1391 1 .2091 P=.022	.0161 1 .2091 P=.420	-.6344 1 .2091 P=.000	.0693 1 .2091 P=.159	.0010 1 .2091 P=.119	.5797 1 .2091 P=.000	.0743 1 .2091 P=.136	.3446 1 .2091 P=.000	-.1604 1 .2091 P=.007
LISH	.7018 1 .2091 P=.000	.3506 1 .2091 P=.000	.4274 1 .2091 P=.000	.1462 1 .2091 P=.000	-.2979 1 .2091 P=.000	-.3744 1 .2091 P=.000	-.6038 1 .2091 P=.000	.5126 1 .2091 P=.000	-.6753 1 .2091 P=.000	.0942 1 .2091 P=.003
END	-.7176 1 .2091 P=.000	-.4517 1 .2091 P=.000	-.5592 1 .2091 P=.000	-.0748 1 .2091 P=.134	.1665 1 .2091 P=.000	.3631 1 .2091 P=.000	.4773 1 .2091 P=.000	-.4595 1 .2091 P=.000	.4462 1 .2091 P=.000	.0617 1 .2091 P=.107
SHL	-.1441 1 .2091 P=.019	.7757 1 .2091 P=.000	.0010 1 .2091 P=.400	-.5603 1 .2091 P=.000	-.0533 1 .2091 P=.222	-.3737 1 .2091 P=.000	-.0210 1 .2091 P=.377	.3041 1 .2091 P=.000	.4042 1 .2091 P=.000	-.5327 1 .2091 P=.000
LNG	1.0000 1 .2091 P=.	-.1156 1 .2091 P=.040	-.0193 1 .2091 P=.139	.0025 1 .2091 P=.000	-.1562 1 .2091 P=.012	-.1245 1 .2091 P=.036	-.5629 1 .2091 P=.000	.0900 1 .2091 P=.000	-.0743 1 .2091 P=.000	.3023 1 .2091 P=.000
GAN	-.1156 1 .2091 P=.040	1.0000 1 .2091 P=.	.9341 1 .2091 P=.000	-.3073 1 .2091 P=.000	-.0899 1 .2091 P=.050	-.5294 1 .2091 P=.000	-.4523 1 .2091 P=.000	.0026 1 .2091 P=.000	.1300 1 .2091 P=.030	-.7103 1 .2091 P=.000

(COEFFICIENT / (CELLS) / SIGNIFICANCE)

A VALUE OF .9999 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED

Table K (continued)

SPSS BATCH SYSTEM

FILE NO NAME (CREATION DATE = 03/21/80)
SUBFILE CLAS1 CLAS2 CLAS3 CLAS4 CLAS5 CLAS6 CLAS7 CLAS8 CLAS9

	PEARSON CORRELATION COEFFICIENTS									
	LNH	QAM	CONET	UNJLG	OBJSM	CONLO	CONSH	ACTLO	ACTSH	INSLG
CONET	-.0753 (.209) P=.139	.9341 (.209) P=.000	1.0000 (.209) P=*****	-.4848 (.209) P=.000	-.0462 (.209) P=.253	-.3433 (.209) P=.000	-.3700 (.209) P=.000	.0797 (.209) P=.000	.1029 (.209) P=.069	-.6086 (.209) P=.000
UNJLG	.5025 (.209) P=.000	-.3073 (.209) P=.000	-.4848 (.209) P=.000	1.0000 (.209) P=*****	-.0103 (.209) P=.441	-.0895 (.209) P=.059	-.4401 (.209) P=.000	-.3385 (.209) P=.000	-.4100 (.209) P=.001	.3100 (.209) P=.000
OBJSM	-.1562 (.209) P=.012	-.0899 (.209) P=.098	-.0462 (.209) P=.253	-.0103 (.209) P=.441	1.0000 (.209) P=*****	-.2421 (.209) P=.000	.1906 (.209) P=.003	-.4030 (.209) P=.000	.0076 (.209) P=.000	-.2506 (.209) P=.000
CONLO	-.1245 (.209) P=.036	-.0294 (.209) P=.000	-.3433 (.209) P=.000	-.0895 (.209) P=.059	-.2421 (.209) P=.000	1.0000 (.209) P=*****	.3046 (.209) P=.000	.0119 (.209) P=.432	-.2153 (.209) P=.000	.5703 (.209) P=.000
CONSH	-.5629 (.209) P=.000	-.4523 (.209) P=.000	-.3700 (.209) P=.000	-.4401 (.209) P=.000	.1906 (.209) P=.003	.3046 (.209) P=.000	1.0000 (.209) P=*****	-.5568 (.209) P=.000	.4810 (.209) P=.000	.2611 (.209) P=.000
ACTLO	.2900 (.209) P=.000	.0826 (.209) P=.000	.0797 (.209) P=.000	-.3385 (.209) P=.000	-.4030 (.209) P=.000	.0119 (.209) P=.432	-.5568 (.209) P=.000	1.0000 (.209) P=*****	-.4346 (.209) P=.000	-.1773 (.209) P=.000
ACTSH	-.6743 (.209) P=.000	.1300 (.209) P=.030	.1029 (.209) P=.069	-.2100 (.209) P=.001	.0076 (.209) P=.000	-.2153 (.209) P=.000	.4810 (.209) P=.000	-.4346 (.209) P=.000	1.0000 (.209) P=*****	-.5336 (.209) P=.000
INSLG	.3023 (.209) P=.000	-.7163 (.209) P=.000	-.6086 (.209) P=.000	.3100 (.209) P=.000	-.2506 (.209) P=.000	.5703 (.209) P=.000	.2611 (.209) P=.000	-.1773 (.209) P=.000	-.5336 (.209) P=.000	1.0000 (.209) P=*****
INSSH	-.7014 (.209) P=.000	.0455 (.209) P=.256	.0096 (.209) P=.446	-.1501 (.209) P=.012	.4189 (.209) P=.000	-.1870 (.209) P=.003	.3150 (.209) P=.000	-.6777 (.209) P=.000	.9606 (.209) P=.000	-.4050 (.209) P=.000
QRO	-.0950 (.209) P=.086	.6034 (.209) P=.000	.0474 (.209) P=.000	-.1377 (.209) P=.023	-.0332 (.209) P=.317	-.7704 (.209) P=.000	-.2755 (.209) P=.000	.0493 (.209) P=.197	.0814 (.209) P=.000	-.7000 (.209) P=.000
PATLO	.5551 (.209) P=.000	.6560 (.209) P=.000	.5490 (.209) P=.000	-.0304 (.209) P=.331	-.3750 (.209) P=.000	-.2302 (.209) P=.000	-.0095 (.209) P=.000	.0770 (.209) P=.000	-.6433 (.209) P=.000	-.2232 (.209) P=.001

(COEFFICIENT / (CASES) / SIGNIFICANCE)

(A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)

Table K (continued)

SPSS BATCH SYSTEM

FILE NONAME (CREATION DATE = 03/31/99)
SUBFILE CLAS1 CLAS2 CLAS3 CLAS4 CLAS5 CLAS6 CLAS7 CLAS8 CLAS9

	PEARSON CORRELATION COEFFICIENTS									
	LRU	GAH	COMET	OHJLG	OHJSH	CONLG	CONSH	ACTLG	ACTSH	INSLG
PATSH	-.6761 (209) P=.000	.0020 (209) P=.323	-.0272 (209) P=.348	-.2473 (209) P=.000	.6409 (209) P=.000	-.3349 (209) P=.000	.5307 (209) P=.000	-.6260 (209) P=.000	.9471 (209) P=.000	-.5307 (209) P=.000
DIAOLG	-.3117 (209) P=.000	.2483 (209) P=.000	.1646 (209) P=.009	.1410 (209) P=.020	-.2310 (209) P=.000	.1009 (209) P=.004	-.0612 (209) P=.109	-.0631 (209) P=.102	.4953 (209) P=.000	-.3196 (209) P=.000
DIAOSH	-.7149 (209) P=.000	.0941 (209) P=.000	.0491 (209) P=.248	-.0035 (209) P=.400	.3114 (209) P=.000	-.0023 (209) P=.110	.2091 (209) P=.000	-.6460 (209) P=.000	.0577 (209) P=.000	-.4573 (209) P=.000
EVALLG	-.0490 (209) P=.237	.0009 (209) P=.000	.4304 (209) P=.000	-.3000 (209) P=.000	-.3002 (209) P=.000	-.6374 (209) P=.000	-.1041 (209) P=.004	.3021 (209) P=.000	-.1103 (209) P=.054	-.2090 (209) P=.000
EVALSH	-.6450 (209) P=.000	.1733 (209) P=.000	-.0235 (209) P=.308	-.4602 (209) P=.000	-.2426 (209) P=.000	-.3074 (209) P=.000	.3901 (209) P=.000	-.0960 (209) P=.002	.4390 (209) P=.000	-.3074 (209) P=.000
ALTNLG	-.3400 (209) P=.000	.4172 (209) P=.001	-.0077 (209) P=.456	-.3132 (209) P=.000	-.1409 (209) P=.021	-.3900 (209) P=.000	.1645 (209) P=.010	.1193 (209) P=.043	.0119 (209) P=.432	-.0041 (209) P=.170
ALTNSH	-.3190 (209) P=.000	.0602 (209) P=.193	.0243 (209) P=.363	.3449 (209) P=.000	-.1110 (209) P=.054	.2394 (209) P=.000	-.3010 (209) P=.000	-.2022 (209) P=.002	.1501 (209) P=.015	-.1060 (209) P=.002
SPSTACH	-.3226 (209) P=.000	-.1379 (209) P=.023	-.1061 (209) P=.002	-.0701 (209) P=.157	.0276 (209) P=.346	-.0415 (209) P=.275	.3672 (209) P=.000	-.3363 (209) P=.000	.4267 (209) P=.000	.1740 (209) P=.000
TOTMOT	-.1253 (209) P=.025	.0034 (209) P=.000	.9675 (209) P=.000	-.0343 (209) P=.000	-.0612 (209) P=.189	-.4142 (209) P=.000	-.2127 (209) P=.001	.4842 (209) P=.000	.4191 (209) P=.001	-.6170 (209) P=.000
PCTSMI	-.7110 (209) P=.000	.0347 (209) P=.309	-.0063 (209) P=.464	-.0476 (209) P=.000	.6171 (209) P=.000	-.2770 (209) P=.000	.6507 (209) P=.000	-.6509 (209) P=.000	.9874 (209) P=.000	-.4900 (209) P=.000
PHBSLV	-.0740 (209) P=.143	-.0330 (209) P=.313	-.0572 (209) P=.205	-.2104 (209) P=.001	-.0040 (209) P=.473	-.0700 (209) P=.157	.0781 (209) P=.130	.1007 (209) P=.073	-.1601 (209) P=.015	.1470 (209) P=.017

(COEFFICIENT / (CASES) / SIGNIFICANCE)

A VALUE OF 99.000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED

Table K (continued)

SPSS MATCH SYSTEM

FILE NAME (CREATION DATE = 02/31/80)
SUBFILE CLAS1 CLAS2 CLAS3 CLAS4 CLAS5 CLAS6 CLAS7 CLAS8 CLAS9

	PEARSON CORRELATION COEFFICIENTS									
	INSHM	ORU	MATLU	MATSH	DIAGLU	DIAGSH	EVALLG	EVALSH	ALTMLO	ALTMSH
COMP	-.0236 (100) P=.374	.0770 (100) P=.147	-.0102 (100) P=.445	.0309 (100) P=.298	-.0550 (100) P=.000	-.0167 (100) P=.410	.2955 (100) P=.000	.2197 (100) P=.001	.4312 (100) P=.000	-.0201 (100) P=.351
PLNSCR	.0974 (209) P=.000	.3944 (209) P=.000	-.0170 (209) P=.000	.9051 (209) P=.000	.2031 (209) P=.000	.0377 (209) P=.000	-.1091 (209) P=.003	.1415 (209) P=.021	-.0927 (209) P=.091	.2206 (209) P=.000
PPLNSCR	.0094 (209) P=.000	.3054 (209) P=.000	-.0781 (209) P=.000	.0908 (209) P=.000	.3005 (209) P=.000	.0361 (209) P=.000	-.0469 (209) P=.455	.3420 (209) P=.000	.1347 (209) P=.020	.2449 (209) P=.000
ORSCN	-.0794 (209) P=.126	.0772 (409) P=.000	.3612 (209) P=.000	-.0076 (209) P=.104	-.0261 (209) P=.354	-.0926 (209) P=.009	.2243 (209) P=.001	-.2177 (209) P=.001	-.1000 (209) P=.000	-.0760 (209) P=.134
SUMATT1	-.0492 (209) P=.337	.0409 (209) P=.339	-.0493 (209) P=.239	-.0160 (209) P=.409	-.0671 (209) P=.167	-.1071 (209) P=.001	.1726 (209) P=.006	.1694 (209) P=.007	.1733 (209) P=.006	-.1061 (209) P=.002
SUMATT2	.0050 (209) P=.471	.0012 (209) P=.493	-.0500 (209) P=.002	.0135 (209) P=.423	.0105 (209) P=.440	-.0605 (209) P=.192	.0913 (209) P=.094	.1930 (209) P=.003	.1313 (209) P=.029	-.1396 (209) P=.022
SPERCLN	.1541 (209) P=.013	.0270 (209) P=.345	-.1707 (209) P=.007	.1405 (209) P=.021	.0052 (209) P=.470	.1320 (209) P=.040	.0975 (209) P=.000	.1045 (209) P=.004	.1134 (209) P=.017	.0069 (209) P=.446
LEPERCLN	.1241 (209) P=.026	.1279 (209) P=.032	-.0766 (209) P=.135	.1072 (209) P=.061	.0142 (209) P=.419	.1122 (209) P=.053	.1025 (209) P=.070	.1407 (209) P=.021	.0593 (209) P=.197	-.0030 (209) P=.403
OUTLNS	-.2704 (209) P=.000	.3952 (209) P=.000	.4339 (209) P=.000	-.1372 (209) P=.024	-.3900 (209) P=.000	-.2726 (209) P=.000	.0371 (209) P=.000	-.0960 (209) P=.003	.3922 (209) P=.000	-.1902 (209) P=.002
ENPLNS	-.3540 (209) P=.000	.0230 (209) P=.000	.7352 (209) P=.000	-.3392 (209) P=.000	-.1373 (209) P=.024	-.3467 (209) P=.000	.0569 (209) P=.000	-.1940 (209) P=.002	.0129 (209) P=.426	-.1015 (209) P=.003
REVSCH	-.3013 (209) P=.000	.4644 (209) P=.000	.0554 (209) P=.000	-.4400 (209) P=.000	-.1440 (209) P=.019	-.3671 (209) P=.000	.3255 (209) P=.000	-.4259 (209) P=.000	-.4753 (209) P=.000	-.1760 (209) P=.000

(COEFFICIENT / (CASES) / SIGNIFICANCE)

A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED

Table K (continued)

SPSS MATCH SYSTEM

FILE NONAME (CREATION DATE = 03/31/89)

SUBFILE CL41 CL42 CL43 CL44 CL45 CL46 CL47 CL48 CL49

	PEARSON CORRELATION COEFFICIENTS									
	INSHM	ORG	MATLO	MATSH	DIAGLO	DIAGSH	EVALLO	EVALSH	ALTMLO	ALTMSH
HLTS	-.5271 t 2091 P=.000	.0030 t 2091 P=.423	.4432 t 2091 P=.000	-.5650 t 2091 P=.000	-.7105 t 2091 P=.001	-.6672 t 2091 P=.000	-.0794 t 2091 P=.127	-.5260 t 2091 P=.000	-.4294 t 2091 P=.000	-.2910 t 2091 P=.000
HEPGE	-.1512 t 2091 P=.012	-.0267 t 2091 P=.290	.0656 t 2091 P=.173	-.1606 t 2091 P=.010	.0741 t 2091 P=.143	-.1701 t 2091 P=.007	-.2059 t 2091 P=.000	-.1530 t 2091 P=.014	-.4077 t 2091 P=.000	-.0192 t 2091 P=.393
LNPMP	-.2200 t 2091 P=.000	-.0537 t 2091 P=.220	-.0067 t 2091 P=.452	-.0955 t 2091 P=.004	-.3410 t 2091 P=.000	-.2356 t 2091 P=.000	.6305 t 2091 P=.000	.5765 t 2091 P=.000	.0679 t 2091 P=.000	-.1377 t 2091 P=.043
OTHER	.4499 t 2091 P=.000	-.4021 t 2091 P=.000	-.6452 t 2091 P=.000	.4636 t 2091 P=.000	.1073 t 2091 P=.003	.4452 t 2091 P=.000	-.3908 t 2091 P=.000	.3310 t 2091 P=.000	.1403 t 2091 P=.021	.2140 t 2091 P=.001
ENG	-.3364 t 2091 P=.000	.1391 t 2091 P=.022	.3024 t 2091 P=.000	-.4202 t 2091 P=.000	-.1420 t 2091 P=.020	-.1925 t 2091 P=.003	-.2350 t 2091 P=.000	-.4400 t 2091 P=.000	-.0063 t 2091 P=.000	.2160 t 2091 P=.001
CFTSH	.3120 t 2091 P=.000	-.1463 t 2091 P=.017	-.3491 t 2091 P=.000	.4005 t 2091 P=.000	.1757 t 2091 P=.005	.1741 t 2091 P=.005	.2210 t 2091 P=.001	.6175 t 2091 P=.000	.0624 t 2091 P=.000	-.2172 t 2091 P=.001
LISH	-.6536 t 2091 P=.000	.3024 t 2091 P=.000	.7693 t 2091 P=.000	-.0314 t 2091 P=.000	-.4053 t 2091 P=.000	-.6543 t 2091 P=.000	.4291 t 2091 P=.000	-.3703 t 2091 P=.000	-.0703 t 2091 P=.130	-.3499 t 2091 P=.000
END	.4003 t 2091 P=.000	-.4094 t 2091 P=.000	-.6567 t 2091 P=.000	.4300 t 2091 P=.000	.1687 t 2091 P=.000	.4070 t 2091 P=.000	-.2613 t 2091 P=.000	.4331 t 2091 P=.000	.3194 t 2091 P=.000	.4012 t 2091 P=.000
SHL	.2371 t 2091 P=.000	.4934 t 2091 P=.000	.2060 t 2091 P=.000	.1754 t 2091 P=.004	.1252 t 2091 P=.035	.1366 t 2091 P=.024	.4300 t 2091 P=.000	.1366 t 2091 P=.024	-.0471 t 2091 P=.249	-.2007 t 2091 P=.000
LNO	-.7014 t 2091 P=.000	-.0950 t 2091 P=.006	.5501 t 2091 P=.000	-.0741 t 2091 P=.000	-.3117 t 2091 P=.000	-.7129 t 2091 P=.000	-.0498 t 2091 P=.237	-.0450 t 2091 P=.000	-.3400 t 2091 P=.000	-.3100 t 2091 P=.000
SHH	.0655 t 2091 P=.256	.4034 t 2091 P=.000	.5540 t 2091 P=.000	.0320 t 2091 P=.323	.2403 t 2091 P=.000	.0941 t 2091 P=.000	.4099 t 2091 P=.000	.1733 t 2091 P=.006	.0174 t 2091 P=.001	.0602 t 2091 P=.193

(COEFFICIENT / CASES) / SIGNIFICANCE)

(A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)

Table K (continued)

SPSS BATCH SYSTEM

FILE NONAME ICHEATION DATE = 03/31/89
SUM (LE CLAS) CLAS CLAS CLAS CLAS CLAS CLAS

	CORRELATION COEFFICIENTS										
	INSHH	ONG	MATLO	HAISH	DIAULO	DIAUSH	EVALLG	EVALSH	ALIMLG	ALIMSH	
COMET	.0094 (209) P=.444	.0074 (209) P=.000	.0490 (209) P=.000	-.0272 (209) P=.348	.1044 (209) P=.009	.0491 (209) P=.240	.4364 (209) P=.000	-.0235 (209) P=.368	-.0077 (209) P=.406	.0243 (209) P=.363	
OBJLG	-.1561 (209) P=.012	-.1377 (209) P=.023	-.0104 (209) P=.331	-.2473 (209) P=.000	.1418 (209) P=.020	-.0035 (209) P=.480	-.3060 (209) P=.000	-.4082 (209) P=.000	-.3132 (209) P=.000	.3449 (209) P=.000	
OBJSH	.4109 (209) P=.000	-.0332 (209) P=.317	-.3750 (209) P=.000	.6409 (209) P=.000	-.2310 (209) P=.000	.3114 (209) P=.000	-.3092 (209) P=.000	-.2426 (209) P=.000	-.1009 (209) P=.021	-.1116 (209) P=.044	
CONLG	-.1070 (209) P=.003	-.7704 (209) P=.000	-.2302 (209) P=.000	-.3349 (209) P=.000	.1009 (209) P=.004	-.0023 (209) P=.118	-.6374 (209) P=.000	-.3074 (209) P=.000	-.3008 (209) P=.000	.2304 (209) P=.000	
CONSH	.5100 (209) P=.000	-.2755 (209) P=.000	-.0095 (209) P=.000	.5307 (209) P=.000	-.0012 (209) P=.109	.2091 (209) P=.000	-.1041 (209) P=.004	.3901 (209) P=.000	.1446 (209) P=.010	-.3010 (209) P=.000	
ACTLG	-.6777 (209) P=.000	.0543 (209) P=.197	.0770 (209) P=.000	-.6268 (209) P=.000	-.0031 (209) P=.102	-.6260 (209) P=.000	.3021 (209) P=.000	-.0940 (209) P=.002	.1193 (209) P=.043	-.2022 (209) P=.002	
ACTSH	.0606 (209) P=.000	.0014 (209) P=.000	-.0633 (209) P=.000	.0671 (209) P=.000	.2053 (209) P=.000	.0577 (209) P=.000	-.1103 (209) P=.056	.3390 (209) P=.000	.0119 (209) P=.432	.1501 (209) P=.016	
INSLG	-.4450 (209) P=.000	-.7006 (209) P=.000	-.2232 (209) P=.001	-.6307 (209) P=.000	-.3196 (209) P=.000	-.4457 (209) P=.000	-.2000 (209) P=.000	-.3074 (209) P=.000	-.0641 (209) P=.170	-.1000 (209) P=.062	
INSHH	1.0000 (209) P=0.000	.3070 (209) P=.000	-.7153 (209) P=.000	.9240 (209) P=.000	.4697 (209) P=.000	.9103 (209) P=.000	-.1770 (209) P=.003	.3941 (209) P=.000	-.0677 (209) P=.166	.2412 (209) P=.000	
ONG	.3070 (209) P=.000	1.0000 (209) P=0.000	.2037 (209) P=.000	.3633 (209) P=.000	.1730 (209) P=.004	.3196 (209) P=.000	.5271 (209) P=.000	.3075 (209) P=.000	-.0793 (209) P=.127	-.0050 (209) P=.307	
MATLO	-.7153 (209) P=.000	.2037 (209) P=.000	1.0000 (209) P=0.000	-.6636 (209) P=.000	-.1009 (209) P=.003	-.6340 (209) P=.000	.4123 (209) P=.000	-.2146 (209) P=.001	-.0007 (209) P=.490	-.1510 (209) P=.016	

(COEFFICIENT / (CASES) / SIGNIFICANCE)

(A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)

Table K (continued)

SPSS BATCH SYSTEM

FILE NONAME ICREATION DATE = 03/31/80

FILE	NONAME	ICREATION	DATE	CLAS1	CLAS2	CLAS3	CLAS4	CLAS5	CLAS6	CLAS7	CLAS8	CLAS9
SUBFILE	CLAS1	CLAS2	CLAS3	CLAS4	CLAS5	CLAS6	CLAS7	CLAS8	CLAS9	CLAS10	CLAS11	CLAS12
----- P L A N S U N C O E F F I C I E N T S -----												
	INSSH	ORU	MATLO	MATSH	DIAGLO	DIAGSH	EVALLO	EVALSH	ALTMLO	ALTMSH		
PAISH	.9249 t 2091 P=.000	.3633 t 2091 P=.000	-.6634 t 2091 P=.000	1.0000 t 2091 P=.000	.1819 t 2091 P=.004	.7671 t 2091 P=.000	-.1849 t 2091 P=.065	.4409 t 2091 P=.000	.0921 t 2091 P=.092	.0114 t 2091 P=.438		
DIAGLO	.4697 t 2091 P=.000	.1730 t 2091 P=.006	-.1809 t 2091 P=.003	.1819 t 2091 P=.004	1.0000 t 2091 P=.000	.6025 t 2091 P=.000	-.2334 t 2091 P=.000	.0510 t 2091 P=.232	-.3076 t 2091 P=.000	.3752 t 2091 P=.000		
DIAGSH	.9163 t 2091 P=.000	.3196 t 2091 P=.000	-.6348 t 2091 P=.000	.7671 t 2091 P=.000	.6025 t 2091 P=.000	1.0000 t 2091 P=.000	-.2080 t 2091 P=.001	.2700 t 2091 P=.000	-.9907 t 2091 P=.000	.6000 t 2091 P=.000		
EVALLO	-.1770 t 2091 P=.005	.6271 t 2091 P=.000	.4123 t 2091 P=.000	-.1049 t 2091 P=.065	-.2334 t 2091 P=.000	-.2080 t 2091 P=.001	1.0000 t 2091 P=.000	.5922 t 2091 P=.000	.7010 t 2091 P=.000	-.4291 t 2091 P=.000		
EVALSH	.3941 t 2091 P=.000	.3076 t 2091 P=.000	-.2146 t 2091 P=.001	.4409 t 2091 P=.000	.0510 t 2091 P=.232	.2700 t 2091 P=.000	.5922 t 2091 P=.000	1.0000 t 2091 P=.000	.7160 t 2091 P=.000	-.1216 t 2091 P=.040		
ALTMLO	-.0677 t 2091 P=.165	.0793 t 2091 P=.127	-.0007 t 2091 P=.496	.0921 t 2091 P=.092	-.3075 t 2091 P=.000	-.0907 t 2091 P=.096	.7010 t 2091 P=.000	.7160 t 2091 P=.000	1.0000 t 2091 P=.000	-.1405 t 2091 P=.016		
ALTMSH	.2418 t 2091 P=.000	-.0350 t 2091 P=.307	-.1510 t 2091 P=.015	.0114 t 2091 P=.435	.5752 t 2091 P=.000	.6000 t 2091 P=.000	-.2291 t 2091 P=.000	-.1216 t 2091 P=.040	-.1405 t 2091 P=.016	1.0000 t 2091 P=.000		
SPSTACH	.2133 t 2091 P=.001	-.1013 t 2091 P=.072	-.4004 t 2091 P=.000	.2178 t 2091 P=.001	-.0822 t 2091 P=.110	.2134 t 2091 P=.001	.1923 t 2091 P=.003	.3113 t 2091 P=.000	.4071 t 2091 P=.000	.0726 t 2091 P=.149		
TOTMOT	.1439 t 2091 P=.019	.6966 t 2091 P=.000	.4102 t 2091 P=.000	.0943 t 2091 P=.083	.1674 t 2091 P=.000	.1093 t 2091 P=.058	.4002 t 2091 P=.000	.1045 t 2091 P=.066	.9157 t 2091 P=.011	-.0926 t 2091 P=.091		
PCTSHL	.9522 t 2091 P=.000	.3326 t 2091 P=.000	-.7120 t 2091 P=.000	.9910 t 2091 P=.000	.2367 t 2091 P=.000	.0229 t 2091 P=.000	-.1264 t 2091 P=.034	.4105 t 2091 P=.000	.0702 t 2091 P=.156	.0092 t 2091 P=.100		
PHUSLV	-.2362 t 2091 P=.000	-.1340 t 2091 P=.027	.0662 t 2091 P=.170	-.0931 t 2091 P=.090	-.4636 t 2091 P=.000	-.2442 t 2091 P=.000	.3201 t 2091 P=.000	.2078 t 2091 P=.001	.4649 t 2091 P=.000	-.1632 t 2091 P=.009		

(COEFFICIENT / CLAS5) / SIGNIFICANCE)

A VALUE OF .00000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)

Table K (continued)

SPSS BATCH SYSTEM

FILE MONAME (CREATION DATE = 03/31/80)
SUBFILE CLA1 CLA2 CLA3 CLA4 CLA5 CLA6 CLA7 CLA8 CLA9

PEARSON CORRELATION COEFFICIENTS				
	SPSTACH	TOIMUT	PCTSHL	PHHSLV
COMP	.6263 1 1001 P= .000	.6219 1 1001 P= .003	.6379 1 1001 P= .003	.6861 1 1001 P= .000
PLNSCH	.1799 1 2091 P= .005	.1209 1 2091 P= .631	.9241 1 2091 P= .000	-.1997 1 2091 P= .002
PPLNSCH	.2919 1 2091 P= .000	-.0006 1 2091 P= .997	.9106 1 2091 P= .000	-.1311 1 2091 P= .029
QUSCLA	-.1946 1 2091 P= .002	.1516 1 2091 P= .014	-.1301 1 2091 P= .030	-.1877 1 2091 P= .003
SUNATT1	.3050 1 2091 P= .000	-.0816 1 2091 P= .120	-.0298 1 2091 P= .334	.1845 1 2091 P= .004
SUNATT2	.3134 1 2091 P= .000	-.1164 1 2091 P= .047	-.0047 1 2091 P= .473	.1074 1 2091 P= .003
SPENCLH	.4203 1 2091 P= .000	.0491 1 2091 P= .240	.1576 1 2091 P= .011	.3295 1 2091 P= .000
LSPENCLH	.3656 1 2091 P= .000	.1214 1 2091 P= .040	.1191 1 2091 P= .043	.2240 1 2091 P= .001
GUTLNS	.0562 1 2091 P= .209	.3057 1 2091 P= .000	-.1509 1 2091 P= .011	.2027 1 2091 P= .002
EXPLNS	-.2376 1 2091 P= .000	.6050 1 2091 P= .000	-.3670 1 2091 P= .000	-.0336 1 2091 P= .315
NEVSH	-.2694 1 2091 P= .000	.6159 1 2091 P= .000	-.4396 1 2091 P= .000	-.0950 1 2091 P= .004

(COEFFICIENT / (CASES) / SIGNIFICANCE)

(A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)

Table K (continued)

SPSS MATCH SYSTEM

FILE MONAME (CREATION DATE = 02/31/80)
SUBFILE CLAS1 CLAS2 CLAS3 CLAS4 CLAS5 CLAS6 CLAS7 CLAS8 CLAS9

	PEARSON CORRELATION COEFFICIENTS			
	SPSTACH	TOTNUT	PCTSHL	MHSLSV
RLTS	-.3158 (209) P= .000	-.1581 (209) P= .015	-.5944 (209) P= .000	-.1619 (209) P= .010
REFUG	-.3191 (209) P= .001	-.4033 (209) P= .000	-.2101 (209) P= .000	-.2131 (209) P= .001
ENPHIP	.3595 (209) P= .000	-.3536 (209) P= .000	-.1353 (209) P= .025	.4040 (209) P= .000
OTHER	.2634 (209) P= .000	-.3725 (209) P= .000	.4925 (209) P= .000	.0735 (209) P= .145
ENG	-.2970 (209) P= .000	-.0587 (209) P= .199	-.4271 (209) P= .000	-.1720 (209) P= .006
CFTSH	.2677 (209) P= .000	.0670 (209) P= .160	.3980 (209) P= .000	.1499 (209) P= .015
LISH	-.2476 (209) P= .000	.4039 (209) P= .000	-.4523 (209) P= .000	.0713 (209) P= .152
JND	.3347 (209) P= .000	-.5786 (209) P= .000	.4439 (209) P= .000	.1294 (209) P= .031
SML	-.0509 (209) P= .077	.4674 (209) P= .000	.1990 (209) P= .002	-.0968 (209) P= .002
LNO	-.3226 (209) P= .000	-.1253 (209) P= .035	-.7116 (209) P= .000	-.0740 (209) P= .143
GAM	-.1379 (209) P= .023	.4034 (209) P= .000	.0347 (209) P= .309	-.0330 (209) P= .313

(COEFFICIENT / (CASES) / SIGNIFICANCE)

(A VALUE OF 99.000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)

622

Table K (continued)

SPSS BATCH SYSTEM

FILE H0NAME (CREATION DATE = 03/31/88)

SUBFILE CL1 CL2 CL3 CL4 CL5 CL6 CL7 CL8 CL9

----- PEARSON CORRELATION COEFFICIENTS -----

	SPSTACH	TOTHT	PCTSHL	PHNSLV
COMET	-.1961 (209) P= .002	.9675 (209) P= .000	-.0063 (209) P= .464	-.0572 (209) P= .205
GBJL0	-.0701 (209) P= .157	-.5343 (209) P= .000	-.2474 (209) P= .000	-.2104 (209) P= .001
GBJSH	.0274 (209) P= .346	-.0012 (409) P= .109	.6171 (209) P= .000	-.0040 (209) P= .672
CONLG	-.0415 (209) P= .275	-.4142 (209) P= .000	-.2770 (209) P= .000	-.0700 (209) P= .157
CONSH	.3672 (209) P= .000	-.2127 (209) P= .001	.5507 (209) P= .000	.0701 (209) P= .130
ACTLG	-.3363 (209) P= .000	.4542 (209) P= .000	-.6509 (209) P= .000	.1007 (209) P= .073
ACTSH	.2267 (209) P= .000	.2197 (209) P= .001	.9074 (209) P= .000	-.1501 (209) P= .016
INSL0	.1740 (209) P= .006	-.0170 (209) P= .000	-.4050 (209) P= .000	.1470 (209) P= .017
INSHW	.2133 (209) P= .001	.1439 (209) P= .019	.9522 (209) P= .000	-.2362 (209) P= .000
OR0	-.1013 (209) P= .072	.6965 (209) P= .000	.3326 (209) P= .000	-.1340 (209) P= .027
PATLG	-.6094 (209) P= .000	.4302 (209) P= .000	-.7120 (209) P= .000	.0062 (209) P= .170

(COEFFICIENT / (CASES) / SIGNIFICANCE)

(A VALUE OF 99.9999 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)

Table K (continued)

SPSS BATCH SYSTEM

FILE NONAME (CREATION DATE = 03/31/89)

SUBFILE CLA1 CLA2 CLA3 CLA4 CLA5 CLA6 CLA7 CLA8 CLA9

PEARSON CORRELATION COEFFICIENTS				
	SPSTACH	TOTMOY	PCTSM	PRMSLV
PATBN	.2170 (.209) P=.001	.0963 (.209) P=.003	.9910 (.209) P=.000	-.0931 (.209) P=.090
DIAGLO	-.0022 (.209) P=.110	.1674 (.209) P=.000	.2367 (.209) P=.000	-.4630 (.209) P=.000
DIAGSH	.2134 (.209) P=.001	.1093 (.209) P=.050	.0229 (.209) P=.000	-.2442 (.209) P=.000
EVALLO	.1923 (.209) P=.003	.4002 (.209) P=.000	-.1244 (.209) P=.034	.3201 (.209) P=.000
EVALSH	.3113 (.209) P=.000	.1045 (.209) P=.066	.4105 (.209) P=.000	.2070 (.209) P=.001
ALTNLO	.4071 (.209) P=.000	.0157 (.209) P=.411	.0762 (.209) P=.156	.4649 (.209) P=.000
ALTNSH	.0725 (.209) P=.140	-.0925 (.209) P=.091	.0092 (.209) P=.100	-.1632 (.209) P=.000
SPSTACH	1.0000 (.209) P=*****	-.1394 (.209) P=.022	.2505 (.209) P=.000	.5956 (.209) P=.000
TOTMOY	-.1394 (.209) P=.042	1.0000 (.209) P=*****	.1160 (.209) P=.047	-.0772 (.209) P=.133
PCTSM	.2505 (.209) P=.000	.1160 (.209) P=.047	1.0000 (.209) P=*****	-.1074 (.209) P=.061
PRMSLV	.5956 (.209) P=.000	-.0772 (.209) P=.133	-.1074 (.209) P=.061	1.0000 (.209) P=*****

(COEFFICIENT / (CASES) / SIGNIFICANCE)

A VALUE OF .000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED

KEY FOR TABLE L

SZOU = Outlining objectives
SZEX = Explains what to do next
SZRS = Reviews/summarizes
SZRE = Relates content
SZRP = Repeats question/explanation
SZEM = Emphasizes important point
SZOT = Other
SZEN = Engaged
SZOF = Off-task
SZLN = Listening
SZIN = Individual grouping
SZSM = Small grouping
SZLG = Large grouping
SZGM = Games/puzzles
SZCM = Competition
SZOBL = Objectives (large)
SZOSM = Objectives (small)
SZCLG = Content (large)
SZCSM = Content (small)
SZALG = Activities (large)
SZASM = Activities (small)
SZILG = Instruction (large)
SZISM = Instruction (small)

KEY FOR TABLE L (continued)

SZORG = Organization
SZMLG = Materials (large)
SZMSM = Materials (small)
SZDLG = Diagnosis (large)
SZDSM = Diagnosis (small)
SZELG = Evaluation (large)
SZESM = Evaluation (small)
SZTLG = Alternative procedures (large)
SZTSM = Alternative procedures (small)

Table L

Correlations for Planning and Teacher Behavior Categories (z-scores)

SPSS PATCH SYSTEM

FILE HUMANZ (CREATION DATE = 04/11/80)

SUBFILE	TCH1	TCH2	TCH3	TCH4	TCH5	TCH6	TCH7	TCH8	TCH9	
PEARSON CORRELATION COEFFICIENTS										
	SIZEH	SIZEA	SIZEB	SIZEE	SIZEP	SIZEH	SIZEY	SIZEH	SIZEY	SIZEH
SIZEH	1.0000 (.9) P=.0000	.7957 (.9) P=.005	.6275 (.9) P=.035	.3611 (.9) P=.216	-.3634 (.9) P=.160	.6627 (.9) P=.024	-.7045 (.9) P=.017	.0744 (.9) P=.425	-.0745 (.9) P=.424	.6713 (.9) P=.024
SIZEA	.7957 (.9) P=.005	1.0000	.8928 (.9) P=.001	.5703 (.9) P=.054	-.0676 (.9) P=.431	.3372 (.9) P=.187	-.9246 (.9) P=.000	.2795 (.9) P=.273	-.2795 (.9) P=.273	.8136 (.9) P=.001
SIZEB	.6275 (.9) P=.035	.8928 (.9) P=.001	1.0000	.6426 (.9) P=.031	-.1764 (.9) P=.325	.0667 (.9) P=.432	-.9172 (.9) P=.000	.5068 (.9) P=.082	-.5074 (.9) P=.082	.9516 (.9) P=.000
SIZEE	.3611 (.9) P=.216	.5703 (.9) P=.054	.6426 (.9) P=.031	1.0000	.4738 (.9) P=.099	.1952 (.9) P=.307	-.8128 (.9) P=.004	.6166 (.9) P=.033	-.6158 (.9) P=.033	.6820 (.9) P=.022
SIZEP	-.3634 (.9) P=.160	-.0676 (.9) P=.431	-.1764 (.9) P=.325	.4738 (.9) P=.099	1.0000	.0882 (.9) P=.411	-.1045 (.9) P=.394	.3450 (.9) P=.182	-.3431 (.9) P=.183	-.1753 (.9) P=.126
SIZEH	.6627 (.9) P=.024	.3372 (.9) P=.187	.0667 (.9) P=.432	.1952 (.9) P=.307	.0882 (.9) P=.411	1.0000	-.3454 (.9) P=.181	-.0898 (.9) P=.409	.0917 (.9) P=.407	.1104 (.9) P=.369
SIZEY	-.7045 (.9) P=.017	-.9246 (.9) P=.000	-.9172 (.9) P=.000	-.8128 (.9) P=.004	-.1045 (.9) P=.394	-.3454 (.9) P=.181	1.0000	-.5291 (.9) P=.072	.5290 (.9) P=.072	-.9161 (.9) P=.000
SIZEH	.0744 (.9) P=.425	.2795 (.9) P=.273	.5068 (.9) P=.082	.6166 (.9) P=.033	.3450 (.9) P=.182	-.0898 (.9) P=.409	-.5291 (.9) P=.072	1.0000	-1.0000 (.9) P=.000	.8700 (.9) P=.054
SIZEY	-.0745 (.9) P=.424	-.2795 (.9) P=.273	-.5074 (.9) P=.082	-.6158 (.9) P=.033	-.3431 (.9) P=.183	.0917 (.9) P=.407	.5290 (.9) P=.072	-1.0000 (.9) P=.000	1.0000 (.9) P=.000	-.3721 (.9) P=.054
SIZEH	.6713 (.9) P=.024	.8136 (.9) P=.001	.9516 (.9) P=.000	.6820 (.9) P=.022	-.1753 (.9) P=.126	.1104 (.9) P=.369	-.9161 (.9) P=.000	.5708 (.9) P=.054	-.5721 (.9) P=.054	1.0000 (.9) P=.000
SIZEH	-.0846 (.9) P=.093	-.0867 (.9) P=.084	-.9092 (.9) P=.000	-.3755 (.9) P=.052	.2490 (.9) P=.267	.1507 (.9) P=.349	.7062 (.9) P=.006	-.2469 (.9) P=.261	.2481 (.9) P=.260	-.8415 (.9) P=.002

(COEFFICIENT / (CASES) / SIGNIFICANCE)

(A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)

Table L (continued)

SPSS MATCH SYSTEM

FILE MIRAMIR (CORRELATION PAIR = 04/11/00)

SUBFILE	TCH1	TCH2	TCH3	TCH4	TCH5	TCH6	TCH7	TCH8	TCH9
----- PEARSON CORRELATION COEFFICIENTS -----									
	SZUW	SZUA	SZUB	SZUL	SZUP	SZEM	SZUT	SZLN	SZOF
	SZLN								
SZUW	.2052 (.9) Pa .298	.4104 (.9) Pa .136	.4705 (.9) Pa .096	-.2236 (.9) Pa .242	-.5854 (.9) Pa .049	-.2994 (.9) Pa .217	-.1682 (.9) Pa .333	-.1944 (.9) Pa .308	.1943 (.9) Pa .308
SZUA	.3033 (.9) Pa .154	.5649 (.9) Pa .049	.6246 (.9) Pa .036	.0704 (.9) Pa .001	.2492 (.9) Pa .259	.0071 (.9) Pa .412	-.7606 (.9) Pa .009	.4141 (.9) Pa .134	-.4152 (.9) Pa .133
SZUB	.1351 (.9) Pa .189	.7002 (.9) Pa .016	.7617 (.9) Pa .008	.1422 (.9) Pa .358	-.2334 (.9) Pa .190	-.2910 (.9) Pa .224	-.5379 (.9) Pa .068	.0050 (.9) Pa .414	-.0063 (.9) Pa .413
SZUL	.3152 (.9) Pa .201	.5906 (.9) Pa .067	.7204 (.9) Pa .014	-.0033 (.9) Pa .497	-.5410 (.9) Pa .066	-.1632 (.9) Pa .168	-.4225 (.9) Pa .129	.0994 (.9) Pa .400	-.1012 (.9) Pa .398
SZUP	.2125 (.9) Pa .292	.2198 (.9) Pa .285	.1521 (.9) Pa .348	.5978 (.9) Pa .045	.5716 (.9) Pa .054	.2906 (.9) Pa .224	-.2964 (.9) Pa .145	.6063 (.9) Pa .042	-.6051 (.9) Pa .042
SZEM	-.0300 (.9) Pa .469	-.1927 (.9) Pa .310	-.2244 (.9) Pa .277	-.1828 (.9) Pa .319	-.1136 (.9) Pa .346	-.1952 (.9) Pa .307	.2503 (.9) Pa .258	.0287 (.9) Pa .471	-.0289 (.9) Pa .471
SZUT	-.7577 (.9) Pa .009	-.6869 (.9) Pa .020	-.5472 (.9) Pa .064	-.2887 (.9) Pa .226	.1957 (.9) Pa .307	-.5204 (.9) Pa .075	.5916 (.9) Pa .047	-.1560 (.9) Pa .344	.1544 (.9) Pa .344
SZLN	-.2656 (.9) Pa .245	-.5511 (.9) Pa .062	-.4740 (.9) Pa .099	-.4053 (.9) Pa .140	-.2920 (.9) Pa .223	.0006 (.9) Pa .499	.8594 (.9) Pa .059	-.3165 (.9) Pa .203	.3184 (.9) Pa .202
SZOF	.0063 (.9) Pa .410	.2071 (.9) Pa .227	.1022 (.9) Pa .319	-.0668 (.9) Pa .432	-.1406 (.9) Pa .351	-.1727 (.9) Pa .320	-.1375 (.9) Pa .362	-.4417 (.9) Pa .117	.4391 (.9) Pa .118
SZAB	-.1156 (.9) Pa .384	-.2157 (.9) Pa .269	-.2167 (.9) Pa .288	-.4118 (.9) Pa .135	-.2000 (.9) Pa .296	-.1601 (.9) Pa .340	.3564 (.9) Pa .173	-.8292 (.9) Pa .478	.0311 (.9) Pa .468
SZIL	.0522 (.9) Pa .447	-.2465 (.9) Pa .279	-.0257 (.9) Pa .474	.1442 (.9) Pa .382	-.0746 (.9) Pa .474	.1792 (.9) Pa .322	-.0567 (.9) Pa .442	.2201 (.9) Pa .395	-.2207 (.9) Pa .394
									.2481 (.9) Pa .260
									.7374 (.9) Pa .012
									.6150 (.9) Pa .039
									.5955 (.9) Pa .045
									.2617 (.9) Pa .240
									-.2134 (.9) Pa .291
									-.4517 (.9) Pa .110
									-.5617 (.9) Pa .058
									.1963 (.9) Pa .306
									-.3800 (.9) Pa .154
									.1854 (.9) Pa .316

(CORRELATION / (CABES) / SIGNIFICANCE)

(A VALUE OF .00,000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)

Table L (continued)

SPSS MATCH DESIGN

FILE NUMBER (EXPLANATION DATE: 04/11/00)
SUBFILE TCH1 TCH2 TCH3 TCH4 TCH5 TCH6 TCH7 TCH8 TCH9

	CORRELATION COEFFICIENTS									
	SZ1H	SZ1L	SZ2H	SZ2L	SZ3H	SZ3L	SZ4H	SZ4L	SZ5H	SZ5L
SZ1H	-.2765 (.9) Pa .236	-.1857 (.9) Pa .189	-.3522 (.9) Pa .176	-.4472 (.9) Pa .114	-.5077 (.9) Pa .492	-.1060 (.9) Pa .193	.4497 (.9) Pa .112	-.0347 (.9) Pa .463	.0374 (.9) Pa .462	-.5270 (.9) Pa .072
SZ2H	.3075 (.9) Pa .210	.5201 (.9) Pa .076	.4771 (.9) Pa .097	.0879 (.9) Pa .411	-.0297 (.9) Pa .470	.1459 (.9) Pa .154	-.1857 (.9) Pa .153	.2381 (.9) Pa .269	-.2358 (.9) Pa .271	.2184 (.9) Pa .260
SZ3H	.1066 (.9) Pa .211	.6320 (.9) Pa .634	.6590 (.9) Pa .059	.3716 (.9) Pa .199	.0680 (.9) Pa .431	-.0219 (.9) Pa .478	-.5718 (.9) Pa .054	.0463 (.9) Pa .453	-.0484 (.9) Pa .451	.5765 (.9) Pa .052
SZ4H	-.1881 (.9) Pa .114	-.2837 (.9) Pa .230	-.3159 (.9) Pa .204	-.3920 (.9) Pa .148	-.0849 (.9) Pa .414	-.1053 (.9) Pa .394	.4022 (.9) Pa .142	-.0745 (.9) Pa .424	.0767 (.9) Pa .422	-.4777 (.9) Pa .097
SZ5H	-.2764 (.9) Pa .235	-.1469 (.9) Pa .353	-.1794 (.9) Pa .322	-.1915 (.9) Pa .311	.2589 (.9) Pa .251	-.1327 (.9) Pa .367	.2152 (.9) Pa .289	.0903 (.9) Pa .409	-.0983 (.9) Pa .411	-.3181 (.9) Pa .208
SZ6H	-.2279 (.9) Pa .218	-.3530 (.9) Pa .176	-.4030 (.9) Pa .141	-.4953 (.9) Pa .099	.0360 (.9) Pa .465	-.0838 (.9) Pa .415	.4622 (.9) Pa .105	.0646 (.9) Pa .434	-.0627 (.9) Pa .436	-.4989 (.9) Pa .086
SZ7H	.7783 (.9) Pa .007	.6341 (.9) Pa .033	.5831 (.9) Pa .084	-.0103 (.9) Pa .490	-.4753 (.9) Pa .098	.6323 (.9) Pa .034	-.4793 (.9) Pa .096	-.1826 (.9) Pa .319	.1832 (.9) Pa .319	.4324 (.9) Pa .123
SZ8H	-.0110 (.9) Pa .488	-.1297 (.9) Pa .170	-.2534 (.9) Pa .255	-.3826 (.9) Pa .155	-.0473 (.9) Pa .452	.0344 (.9) Pa .120	.2446 (.9) Pa .263	-.3584 (.9) Pa .172	.3614 (.9) Pa .170	-.4294 (.9) Pa .124
SZ9H	.5749 (.9) Pa .046	.1589 (.9) Pa .342	-.0954 (.9) Pa .484	-.2845 (.9) Pa .279	-.3836 (.9) Pa .175	.0288 (.9) Pa .063	-.0298 (.9) Pa .470	-.4755 (.9) Pa .098	.4763 (.9) Pa .097	-.0533 (.9) Pa .446
SZ10H	-.0964 (.9) Pa .483	-.1789 (.9) Pa .323	-.2235 (.9) Pa .282	-.2798 (.9) Pa .213	.1627 (.9) Pa .338	-.0319 (.9) Pa .468	.2875 (.9) Pa .296	.2772 (.9) Pa .235	-.2774 (.9) Pa .235	-.1534 (.9) Pa .347

(CORRELATIONS) / (CASES) / SIGNIFICANCE)

(A VALUE OF .99,0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)

Table L (continued)

SPSS BATCH STATISTICS

FILE NNNNNF (CREATION DATE = 04/11/80)
SUBFILE YCH1 YCH2 YCH3

FILE	NUMARY	(CREATION DATE = 04/11/80)								
SUNFILE	YCH1	YCH2	YCH3	YCH4	YCH5	YCH6	YCH7	YCH8	YCH9	
CORRELATION COEFFICIENTS										
	SIZE1	SIZE2	SIZE3	SIZE4	SIZE5	SIZE6	SIZE7	SIZE8	SIZE9	
SIZE1	-.4846 (.9) P=.493	.2052 (.9) P=.298	.3833 (.9) P=.154	.3351 (.9) P=.189	.3192 (.9) P=.201	.2125 (.9) P=.292	-.0300 (.9) P=.469	-.7577 (.9) P=.009	-.2658 (.9) P=.245	.0899 (.9) P=.418
SIZE2	-.0867 (.9) P=.004	.4104 (.9) P=.114	.5849 (.9) P=.049	.7082 (.9) P=.016	.8906 (.9) P=.047	.2190 (.9) P=.285	-.1927 (.9) P=.310	-.6869 (.9) P=.020	-.5511 (.9) P=.062	.2871 (.9) P=.227
SIZE3	-.9092 (.9) P=.000	.4785 (.9) P=.096	.6246 (.9) P=.036	.7637 (.9) P=.008	.7204 (.9) P=.014	.1521 (.9) P=.348	-.2284 (.9) P=.277	-.5472 (.9) P=.064	-.4740 (.9) P=.099	.1022 (.9) P=.319
SIZE4	-.5755 (.9) P=.052	-.2236 (.9) P=.282	.0704 (.9) P=.001	.1422 (.9) P=.358	-.0033 (.9) P=.497	.3978 (.9) P=.045	-.1828 (.9) P=.319	-.2687 (.9) P=.226	-.4053 (.9) P=.140	-.0640 (.9) P=.412
SIZE5	.2400 (.9) P=.267	-.5954 (.9) P=.049	.2492 (.9) P=.259	-.3334 (.9) P=.190	-.5410 (.9) P=.066	.5716 (.9) P=.054	-.1136 (.9) P=.386	.1937 (.9) P=.307	-.2920 (.9) P=.223	-.1406 (.9) P=.351
SIZE6	.1507 (.9) P=.349	-.2494 (.9) P=.217	.0071 (.9) P=.412	-.2910 (.9) P=.226	-.3632 (.9) P=.168	.2906 (.9) P=.224	-.1952 (.9) P=.307	-.5204 (.9) P=.075	.0006 (.9) P=.499	-.1727 (.9) P=.328
SIZE7	.7862 (.9) P=.006	-.1682 (.9) P=.333	-.7606 (.9) P=.009	-.5379 (.9) P=.068	-.4225 (.9) P=.129	-.3964 (.9) P=.145	.2503 (.9) P=.258	.5916 (.9) P=.047	.5594 (.9) P=.059	-.1375 (.9) P=.362
SIZE8	-.2468 (.9) P=.261	-.1944 (.9) P=.308	.4141 (.9) P=.134	.0850 (.9) P=.414	.0994 (.9) P=.400	.6063 (.9) P=.042	.0287 (.9) P=.471	-.1560 (.9) P=.314	-.3165 (.9) P=.203	-.4417 (.9) P=.117
SIZE9	.2481 (.9) P=.260	.1943 (.9) P=.308	-.4152 (.9) P=.133	-.0843 (.9) P=.413	-.1012 (.9) P=.398	-.6051 (.9) P=.042	-.0289 (.9) P=.471	.1544 (.9) P=.314	.3184 (.9) P=.202	.4391 (.9) P=.118
SIZE0	-.0415 (.9) P=.002	.2481 (.9) P=.260	.7174 (.9) P=.012	.6150 (.9) P=.019	.5955 (.9) P=.045	.2617 (.9) P=.248	-.2134 (.9) P=.291	-.4537 (.9) P=.110	-.5617 (.9) P=.050	.1963 (.9) P=.304
SIZE10	1.0000 (.9) P=0.000	-.5561 (.9) P=.060	-.6044 (.9) P=.021	-.8213 (.9) P=.003	-.7577 (.9) P=.009	.0280 (.9) P=.471	.1012 (.9) P=.320	.3894 (.9) P=.150	.4934 (.9) P=.116	-.6258 (.9) P=.127

(COEFFICIENT / (CASES) / SIGNIFICANCE)

(A VALUE OF .0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)

Table L (continued)

SPRS MATCH SYSTEM

FILE RUNAME (CREATION DATE = 04/11/80)
SUBFILE TCH1 TCH2 TCH3 TCH4 TCH5 TCH6 TCH7 TCH8 TCH9

	PEARSON CORRELATION COEFFICIENTS									
	SLIN	SLIN	SLIG	SLIN	SLIN	SLINBL	SLINSM	SLICLG	SLICSM	SLIALG
SLIN	-.5561 (.9) P=.060	1.0000 (.9) P=*****	-.2190 (.9) P=.286	.0140 (.9) P=.006	.0590 (.9) P=.002	-.5440 (.9) P=.065	-.0620 (.9) P=.436	-.3592 (.9) P=.171	.0907 (.9) P=.400	.2242 (.9) P=.201
SLIN	-.4044 (.9) P=.021	-.2190 (.9) P=.286	1.0000 (.9) P=*****	.2447 (.9) P=.263	.1147 (.9) P=.302	.4739 (.9) P=.099	-.1695 (.9) P=.331	-.1202 (.9) P=.371	-.6002 (.9) P=.044	.3107 (.9) P=.300
SLIG	-.0211 (.9) P=.003	.0140 (.9) P=.006	.2447 (.9) P=.263	1.0000 (.9) P=*****	.9579 (.9) P=.000	-.2603 (.9) P=.243	-.2747 (.9) P=.237	-.2713 (.9) P=.240	-.4760 (.9) P=.097	.5266 (.9) P=.073
SLIN	-.3577 (.9) P=.009	.0590 (.9) P=.002	.1147 (.9) P=.302	.9579 (.9) P=.000	1.0000 (.9) P=*****	-.3732 (.9) P=.161	-.1709 (.9) P=.330	-.2567 (.9) P=.252	-.3139 (.9) P=.190	.4274 (.9) P=.126
SLINBL	.0240 (.9) P=.471	-.5440 (.9) P=.065	.4739 (.9) P=.099	-.2603 (.9) P=.243	-.3732 (.9) P=.161	1.0000 (.9) P=*****	-.0051 (.9) P=.495	-.0031 (.9) P=.416	-.3512 (.9) P=.177	-.4013 (.9) P=.141
SLINSM	.1812 (.9) P=.370	-.0620 (.9) P=.436	-.1695 (.9) P=.331	-.2747 (.9) P=.237	-.1709 (.9) P=.330	-.0051 (.9) P=.495	1.0000 (.9) P=*****	-.3312 (.9) P=.192	.4304 (.9) P=.124	-.3775 (.9) P=.150
SLICLG	.3094 (.9) P=.150	-.3592 (.9) P=.171	-.1202 (.9) P=.371	-.2713 (.9) P=.240	-.2567 (.9) P=.252	-.0031 (.9) P=.416	-.3312 (.9) P=.192	1.0000 (.9) P=*****	-.1144 (.9) P=.365	.2665 (.9) P=.244
SLICSM	.4434 (.9) P=.116	.0907 (.9) P=.400	-.6002 (.9) P=.044	-.4760 (.9) P=.097	-.3319 (.9) P=.190	-.3512 (.9) P=.177	.4304 (.9) P=.124	-.1144 (.9) P=.365	1.0000 (.9) P=*****	-.6100 (.9) P=.041
SLIALG	-.4250 (.9) P=.127	.2242 (.9) P=.201	.3107 (.9) P=.300	.5266 (.9) P=.073	.4274 (.9) P=.126	-.4013 (.9) P=.141	-.3775 (.9) P=.158	.2665 (.9) P=.244	-.6100 (.9) P=.041	1.0000 (.9) P=*****
SLASM	.2805 (.9) P=.232	.3705 (.9) P=.163	-.6420 (.9) P=.031	-.0945 (.9) P=.404	.0172 (.9) P=.443	-.1024 (.9) P=.397	.6310 (.9) P=.034	-.3760 (.9) P=.159	.6092 (.9) P=.020	-.6524 (.9) P=.020
SLILG	.0500 (.9) P=.419	-.5256 (.9) P=.073	.3990 (.9) P=.143	-.4630 (.9) P=.004	-.3063 (.9) P=.152	.3332 (.9) P=.190	-.2072 (.9) P=.296	.2745 (.9) P=.237	.1017 (.9) P=.395	-.2115 (.9) P=.274

(COEFFICIENT / (CARET) / SIGNIFICANCE)

(A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)

Table L (continued)

SPSS BATCH 075174

FILE NAME (CREATION DATE = 06/11/00)

FILE	NAME	TCN1	TCN2	TCN3	TCN4	TCN5	TCN6	TCN7	TCN8	TCN9
CORRELATION COEFFICIENTS										
	NAME	TCN1	TCN2	TCN3	TCN4	TCN5	TCN6	TCN7	TCN8	TCN9
FILE	NAME	TCN1	TCN2	TCN3	TCN4	TCN5	TCN6	TCN7	TCN8	TCN9
SI00		-.1156 (.9) P=.304	.0522 (.9) P=.447	-.2765 (.9) P=.236	.3075 (.9) P=.210	.3066 (.9) P=.211	-.1081 (.9) P=.314	-.2768 (.9) P=.235	-.2279 (.9) P=.278	.7703 (.9) P=.007
SI01		-.2157 (.9) P=.289	-.2265 (.9) P=.279	-.3157 (.9) P=.189	.5201 (.9) P=.076	.6328 (.9) P=.034	-.3837 (.9) P=.230	-.1469 (.9) P=.353	-.3530 (.9) P=.174	.6341 (.9) P=.033
SI02		-.2167 (.9) P=.288	-.0457 (.9) P=.474	-.3522 (.9) P=.176	.4771 (.9) P=.097	.5590 (.9) P=.059	-.3159 (.9) P=.204	-.1794 (.9) P=.322	-.4030 (.9) P=.141	.5031 (.9) P=.084
SI03		-.1116 (.9) P=.315	.3442 (.9) P=.182	-.4432 (.9) P=.114	.0879 (.9) P=.411	.3216 (.9) P=.199	-.3420 (.9) P=.148	-.1915 (.9) P=.311	-.4853 (.9) P=.093	-.0103 (.9) P=.490
SI04		-.2060 (.9) P=.296	-.0746 (.9) P=.424	-.0077 (.9) P=.492	-.0297 (.9) P=.470	.0680 (.9) P=.431	-.0849 (.9) P=.414	.3589 (.9) P=.251	.0340 (.9) P=.465	-.4753 (.9) P=.098
SI05		-.1601 (.9) P=.340	-.1792 (.9) P=.322	-.1040 (.9) P=.393	.1459 (.9) P=.354	-.0219 (.9) P=.470	-.1053 (.9) P=.394	-.1327 (.9) P=.367	-.0837 (.9) P=.415	.6323 (.9) P=.034
SI06		.3564 (.9) P=.173	-.0567 (.9) P=.443	.4497 (.9) P=.112	-.3857 (.9) P=.153	-.0718 (.9) P=.454	.4022 (.9) P=.142	.2152 (.9) P=.289	.4622 (.9) P=.105	-.4792 (.9) P=.096
SI07		-.0292 (.9) P=.470	.2201 (.9) P=.265	-.0387 (.9) P=.465	.2181 (.9) P=.269	.0463 (.9) P=.453	-.0745 (.9) P=.424	.0903 (.9) P=.409	.0646 (.9) P=.434	-.1826 (.9) P=.319
SI08		.0311 (.9) P=.400	-.2707 (.9) P=.284	.0374 (.9) P=.462	-.2356 (.9) P=.271	.0404 (.9) P=.451	.0767 (.9) P=.422	-.0883 (.9) P=.411	-.0627 (.9) P=.436	.1832 (.9) P=.319
SI09		-.3008 (.9) P=.156	.1854 (.9) P=.316	-.5279 (.9) P=.072	.2384 (.9) P=.268	.5763 (.9) P=.052	-.4777 (.9) P=.097	-.3101 (.9) P=.208	-.4989 (.9) P=.086	.4334 (.9) P=.123
SI10		.2805 (.9) P=.232	.0500 (.9) P=.449	.4623 (.9) P=.105	-.2866 (.9) P=.227	-.6274 (.9) P=.035	.3689 (.9) P=.164	.2772 (.9) P=.235	.5620 (.9) P=.050	-.3527 (.9) P=.176

(COEFFICIENT / (CASES) / SIGNIFICANCE)

(A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)

Table L (continued)

SPSS MATCH STATISTICS

FILE: HUNANE (CREATION DATE = 04/11/80)

SUBFILE	TCH1	TCH2	TCH3	TCH4	TCH5	TCH6	TCH7	TCH8	TCH9	
	PEARSON	PEARSON	PEARSON	PEARSON	PEARSON	PEARSON	PEARSON	PEARSON	PEARSON	
	SIZE	SIZE	SIZE	SIZE	SIZE	SIZE	SIZE	SIZE	SIZE	
	SIZE	SIZE	SIZE	SIZE	SIZE	SIZE	SIZE	SIZE	SIZE	
SIZE	.1705 (.9) P=.161	-.5256 (.9) P=.071	.2644 (.9) P=.246	.6676 (.9) P=.030	.1841 (.9) P=.314	.2579 (.9) P=.251	.1413 (.9) P=.350	.0823 (.9) P=.417	.4922 (.9) P=.009	.2629 (.9) P=.247
SIZE	-.6420 (.9) P=.031	.1590 (.9) P=.143	-.7466 (.9) P=.010	-.2336 (.9) P=.273	.5495 (.9) P=.063	-.6524 (.9) P=.028	-.3939 (.9) P=.147	-.7093 (.9) P=.016	-.0314 (.9) P=.460	-.6427 (.9) P=.021
SIZE	-.0945 (.9) P=.404	-.4430 (.9) P=.104	-.1753 (.9) P=.324	.5012 (.9) P=.004	.6634 (.9) P=.076	-.2158 (.9) P=.289	.0333 (.9) P=.466	-.2447 (.9) P=.263	.4439 (.9) P=.116	-.1280 (.9) P=.371
SIZE	.0172 (.9) P=.483	-.3463 (.9) P=.152	-.1092 (.9) P=.390	.4662 (.9) P=.103	.5299 (.9) P=.071	-.1264 (.9) P=.373	-.0181 (.9) P=.492	-.1647 (.9) P=.334	.4433 (.9) P=.116	-.1340 (.9) P=.365
SIZE	-.1024 (.9) P=.197	.1332 (.9) P=.190	.0215 (.9) P=.476	-.0036 (.9) P=.496	-.1194 (.9) P=.391	-.1380 (.9) P=.361	.3592 (.9) P=.178	.3088 (.9) P=.302	-.2337 (.9) P=.273	-.3044 (.9) P=.213
SIZE	.6310 (.9) P=.036	-.2072 (.9) P=.296	.2949 (.9) P=.221	-.0069 (.9) P=.493	-.3945 (.9) P=.144	.6787 (.9) P=.022	-.2752 (.9) P=.237	.3323 (.9) P=.191	-.3627 (.9) P=.169	-.2530 (.9) P=.256
SIZE	-.3760 (.9) P=.159	.2745 (.9) P=.217	-.1310 (.9) P=.369	-.6745 (.9) P=.023	-.0244 (.9) P=.471	-.3754 (.9) P=.160	.2272 (.9) P=.278	-.0301 (.9) P=.461	-.6327 (.9) P=.034	-.2412 (.9) P=.266
SIZE	.0092 (.9) P=.020	.1037 (.9) P=.395	.6059 (.9) P=.042	.0984 (.9) P=.401	-.0629 (.9) P=.002	.7421 (.9) P=.011	.0108 (.9) P=.409	.4099 (.9) P=.137	-.0669 (.9) P=.431	.5165 (.9) P=.078
SIZE	-.6524 (.9) P=.029	-.2315 (.9) P=.274	-.6743 (.9) P=.023	-.3115 (.9) P=.207	.0319 (.9) P=.003	-.6579 (.9) P=.027	-.3218 (.9) P=.198	-.6503 (.9) P=.029	.1606 (.9) P=.340	-.3108 (.9) P=.292
SIZE	1.0000 (.9) P=0.0000	-.4091 (.9) P=.177	.0539 (.9) P=.001	.5526 (.9) P=.001	-.6914 (.9) P=.020	.9729 (.9) P=.000	.3730 (.9) P=.161	.0087 (.9) P=.004	-.0549 (.9) P=.444	.4047 (.9) P=.160
SIZE	-.4091 (.9) P=.177	1.0000 (.9) P=0.0000	-.3641 (.9) P=.160	-.5900 (.9) P=.047	-.2716 (.9) P=.218	-.4316 (.9) P=.123	-.2258 (.9) P=.280	-.3226 (.9) P=.199	-.1668 (.9) P=.353	-.2922 (.9) P=.223

(CORRELATIONS) / (CASES) / SIGNIFICANCE

(A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)

Table L (continued)

SPSS BATCH SYSTEM

FILE DOWANE (CREATION DATE = 04/11/80)
SUBFILE TCH1 TCH2 TCH3 TCH4 TCH5 TCH6 TCH7 TCH8 TCH9

	CORRELATION COEFFICIENTS									
	SZASH	SZILG	SZISA	SZUNG	SZMLG	SZNSH	SZOLG	SZDSH	SZELG	SZLSH
SZISA	.0939 (.9) P=.001	-.3641 (.9) P=.168	1.0000 (.9) P=*****	.5533 (.9) P=.061	-.7358 (.9) P=.012	.8562 (.9) P=.002	.7076 (.9) P=.016	.9335 (.9) P=.000	-.0807 (.9) P=.418	.5914 (.9) P=.047
SZUNG	.5576 (.9) P=.061	-.5900 (.9) P=.047	.5533 (.9) P=.061	1.0000 (.9) P=*****	-.0213 (.9) P=.476	.5010 (.9) P=.003	.3997 (.9) P=.143	.4156 (.9) P=.133	.5122 (.9) P=.079	.5367 (.9) P=.048
SZMLG	-.6914 (.9) P=.020	-.2734 (.9) P=.238	-.7358 (.9) P=.012	-.0213 (.9) P=.476	1.0000 (.9) P=*****	-.8968 (.9) P=.019	-.3483 (.9) P=.179	-.6822 (.9) P=.021	.3804 (.9) P=.232	-.3704 (.9) P=.158
SZNSH	.9729 (.9) P=.000	-.4316 (.9) P=.123	.8562 (.9) P=.002	.5010 (.9) P=.003	-.8968 (.9) P=.019	1.0000 (.9) P=*****	.2710 (.9) P=.240	.7488 (.9) P=.010	-.1110 (.9) P=.388	.4473 (.9) P=.114
SZOLG	.3730 (.9) P=.161	-.2258 (.9) P=.260	.7076 (.9) P=.016	.3997 (.9) P=.143	-.3483 (.9) P=.179	.2710 (.9) P=.240	1.0000 (.9) P=*****	.7412 (.9) P=.011	-.1170 (.9) P=.302	.3730 (.9) P=.161
SZDSH	.8087 (.9) P=.004	-.3226 (.9) P=.199	.9335 (.9) P=.000	.4156 (.9) P=.133	-.6822 (.9) P=.021	.7488 (.9) P=.010	.7412 (.9) P=.011	1.0000 (.9) P=*****	-.1416 (.9) P=.339	.4153 (.9) P=.133
SZELG	-.0549 (.9) P=.444	-.1468 (.9) P=.553	-.0807 (.9) P=.418	.5122 (.9) P=.079	.2804 (.9) P=.212	-.1110 (.9) P=.388	-.1170 (.9) P=.302	-.1416 (.9) P=.339	1.0000 (.9) P=*****	.4944 (.9) P=.088
SZISA	.0047 (.9) P=.140	-.2922 (.9) P=.223	.5914 (.9) P=.047	.5367 (.9) P=.048	-.3704 (.9) P=.158	.4473 (.9) P=.114	.3730 (.9) P=.161	.4153 (.9) P=.133	.4944 (.9) P=.088	1.0000 (.9) P=*****
SZTLG	-.0614 (.9) P=.418	.0242 (.9) P=.476	-.0798 (.9) P=.419	.0627 (.9) P=.416	-.0129 (.9) P=.487	-.0222 (.9) P=.477	-.3752 (.9) P=.237	-.0845 (.9) P=.414	.7491 (.9) P=.010	.5371 (.9) P=.068
SZTSH	.1208 (.9) P=.378	-.0579 (.9) P=.441	.3768 (.9) P=.159	.0352 (.9) P=.464	-.1692 (.9) P=.312	.0096 (.9) P=.498	.6982 (.9) P=.018	.6499 (.9) P=.039	-.1661 (.9) P=.335	-.0074 (.9) P=.482

(CORRELATION / (CASES) / SIGNIFICANCE)

(A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)

Table I (continued)

SPSS MATCH SYSTEM

FILE RUNAME (CREATION DATE = 06/11/80)
SUNFILE TCH1 TCH2 TCH3 TCH4 TCH5 TCH6 TCH7 TCH8 TCH9

-----PEARSON CORRELATION COEFFICIENTS-----									
	SZTLG	SZTSA							
SZUH	.5969 (9) Pa .046	-.0964 (9) Pa .401							
SZLE	.1509 (9) Pa .342	-.1709 (9) Pa .323							
SZHS	-.0954 (9) Pa .404	-.2435 (9) Pa .202							
SZHL	-.2045 (9) Pa .229	-.2798 (9) Pa .213							
SZHP	-.3536 (9) Pa .175	.1627 (9) Pa .330							
SZLM	.0200 (9) Pa .903	-.0319 (9) Pa .660							
SZUT	-.0290 (9) Pa .470	.2075 (9) Pa .296							
SZLN	-.4755 (9) Pa .000	.2772 (9) Pa .235							
SZUF	.4763 (9) Pa .007	-.2774 (9) Pa .235							
SZLV	-.0533 (9) Pa .646	-.1536 (9) Pa .347							
SZIN	.2160 (9) Pa .200	.0219 (9) Pa .175							

(COEFFICIENT) / (CASES) / SIGNIFICANCE) /

(A VALUE OF .99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)

Table L (continued)

SPSS MATCH 575164

FILE: HUNAME: (CURATION DATE = 04/11/00)
SUBFILE: TCH1 TCH2 TCH3 TCH4 TCH5 TCH6 TCH7 TCH8 TCH9

----- PEARSON CORRELATION COEFFICIENTS -----									
	SZTLG	SZTSM							
SZSM	-.0225 (9) Pa .477	-.2214 (9) Pa .242							
SZLG	-.2452 (9) Pa .262	-.2965 (9) Pa .219							
SZGM	-.1709 (9) Pa .323	-.1223 (9) Pa .377							
SZCM	-.1551 (9) Pa .345	-.0916 (9) Pa .407							
SZDBL	-.2270 (9) Pa .279	.4629 (9) Pa .094							
SZUSM	-.1250 (9) Pa .374	-.1250 (9) Pa .374							
SZCLG	-.4229 (9) Pa .124	.3186 (9) Pa .202							
SZCSM	.1747 (9) Pa .323	-.3011 (9) Pa .216							
SZALG	-.0535 (9) Pa .446	-.2255 (9) Pa .280							
SZASN	-.0614 (9) Pa .436	.1200 (9) Pa .370							
SZILG	.0242 (9) Pa .475	-.0579 (9) Pa .441							

(COEFFICIENT / (CABS) / SIGNIFICANCE)

(A VALUE OF .99,0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)

Table L (continued)

SPSS BATCH SYSTEM

FILE H004P1 (CREATION DATE = 06/11/80)
SUBFILE TCH1 TCH2 TCH3 TCH4 TCH5 TCH6 TCH7 TCH8 TCH9

----- PLANSUM CORRELATION COEFFICIENTS -----									
	SZ1LG	SZ1SM							
SZ1SM	-.0798 (9) Pa .419	.3708 (9) Pa .159							
SZ0NG	.0627 (9) Pa .436	.0392 (9) Pa .464							
SZALG	-.0129 (9) Pa .487	-.1692 (9) Pa .332							
SZ0SM	-.0222 (9) Pa .477	.0096 (9) Pa .490							
SZ0LG	-.2752 (9) Pa .237	.6982 (9) Pa .018							
SZ0SM	-.0045 (9) Pa .416	.6499 (9) Pa .029							
SZ1LG	.7491 (9) Pa .010	-.1661 (9) Pa .335							
SZ1SM	.5173 (9) Pa .068	-.0074 (9) Pa .492							
SZ1LG	1.0000 (9) Pa .00000	-.1250 (9) Pa .174							
SZ1SM	-.1250 (9) Pa .334	1.0000 (9) Pa .00000							

(COEFFICIENT / (CASES) / SIGNIFICANCE)

(A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)

Table M
Means^a and Standard Deviations for Observed Pupil
Behaviors by Class (Percentages of Occurrence)

Behavior	Class								
	1	2	3	4	5	6	7	8	9
Engaged time									
$\bar{X}$	.90	.77	.87	.88	.82	.82	.79	.86	.69
SD	.05	.07	.10	.05	.07	.10	.08	.04	.19
Listening									
$\bar{X}$	.57	.32	.31	.52	.34	.24	.29	.36	.25
SD	.07	.02	.06	.07	.06	.05	.07	.07	.09
Individual grouping									
$\bar{X}$	.21	.45	.52	.02	.43	.43	.39	.37	.32
SD	.03	.05	.09	.01	.12	.03	.02	.03	.09
Small grouping									
$\bar{X}$	.00	.11	.04	.32	.10	.00	.22	.06	.14
SD	.00	.13	.01	.03	.18	.01	.09	.09	.05
Large grouping									
$\bar{X}$	.79	.44	.45	.66	.47	.57	.39	.57	.55
SD	.03	.10	.09	.03	.11	.03	.09	.07	.06

^aMeans calculated across observed students in each class.

Table M (continued)

Behavior ^a	Class								
	1	2	3	4	5	6	7	8	9
Games/Puzzles									
$\bar{X}$	.04	.08	.07	.13	.06	.00	.07	.07	.16
SD	.00	.03	.06	.01	.05	.00	.07	.07	.04
Competition									
$\bar{X}$	.01	.06	.06	.18	.06	.00	.06	.07	.16
SD	.00	.02	.05	.02	.05	.00	.07	.07	.04
Total motivation strategy use									
$\bar{X}$	.05	.24	.17	.63	.22	.00	.35	.19	.47
SD	.00	.12	.11	.06	.13	.01	.23	.23	.08

^aMeans calculated across observed students in each class.

KEY FOR TABLE N

PROBSLV 1,2* = Mean problem solving ability
COMP 1,2* = Mean mathematics competency
SPSTACH 1,2* = Mean postachievement
SUMATT 11,12** = Mean preinstructional attitude
SUMATT 21,22** = Mean postinstructional attitude
SPERCLR 1,2* = Mean perceived clarity (all items)
OBSCLR = Mean observed clarity
PCTENG = Mean percentage of engagement
MEPLNSCR = Mean raw planning score
PRMPLSCR = Mean proportional planning score
NPERCLR 1,2* = Mean perceived clarity (16 items)

*1: all students
2: observed students

**11/21: all students
12/22: observed students

Table N

Pearson Correlations for Class Means

PEARSON CORRELATIONS FOR CLASS MEANS

FILE HONAME ICREATION DATE = 04/02/001

SUBFILE	CLAS1	CLAS2	CLAS3	CLAS4	CLAS5	CLAS6	CLAS7	CLAS8	CLAS9
PEARSON CORRELATION COEFFICIENTS									
PROBSLV1	PROBSLV2	COMP1	COMP2	SPSTACH1	SPSTACH2	SUMATT11	SUMATT12	SUMATT21	SUMATT22
1.0000 I .91 P .0000	.9510 I .91 P .0000	.8393 I .91 P .0000	.9030 I .91 P .0000	.8022 I .91 P .0000	.4713 I .91 P .100	.1691 I .91 P .332	-.0794 I .91 P .420	.2524 I .91 P .256	-.0516 I .91 P .440
.9510 I .91 P .0000	1.0000 I .91 P .0000	.8600 I .91 P .0000	.9031 I .91 P .0000	.6751 I .91 P .023	.6724 I .91 P .024	.1402 I .91 P .360	-.1044 I .91 P .300	.2333 I .91 P .273	-.0549 I .91 P .444
.8393 I .91 P .0000	.8600 I .91 P .0000	1.0000 I .91 P .0000	.9691 I .91 P .0000	.7201 I .91 P .014	.6910 I .91 P .020	.2340 I .91 P .272	-.1356 I .91 P .364	.2505 I .91 P .251	-.2055 I .91 P .020
.9030 I .91 P .0000	.9031 I .91 P .0000	.9691 I .91 P .0000	1.0000 I .91 P .0000	.6159 I .91 P .039	.5945 I .91 P .046	.1056 I .91 P .393	-.1757 I .91 P .326	.1090 I .91 P .312	-.1579 I .91 P .342
.8022 I .91 P .004	.4713 I .91 P .023	.1691 I .91 P .014	.9031 I .91 P .039	1.0000 I .91 P .0000	.9060 I .91 P .000	.4010 I .91 P .142	.0736 I .91 P .425	.2060 I .91 P .152	-.1004 I .91 P .321
.4713 I .91 P .100	.6724 I .91 P .024	.6910 I .91 P .020	.9045 I .91 P .046	.9060 I .91 P .000	1.0000 I .91 P .0000	.3376 I .91 P .107	.0514 I .91 P .440	.3797 I .91 P .157	-.1105 I .91 P .309
.1691 I .91 P .332	.1402 I .91 P .360	.2340 I .91 P .272	.1056 I .91 P .393	.4010 I .91 P .142	.3376 I .91 P .107	1.0000 I .91 P .0000	.0203 I .91 P .003	.7907 I .91 P .005	.1043 I .91 P .310
-.0794 I .91 P .420	-.1044 I .91 P .300	-.1356 I .91 P .364	-.1757 I .91 P .326	.0736 I .91 P .425	.0514 I .91 P .440	.0203 I .91 P .003	1.0000 I .91 P .0000	.0690 I .91 P .024	.6343 I .91 P .033
.2524 I .91 P .256	.2333 I .91 P .273	.2505 I .91 P .251	.1090 I .91 P .312	.3060 I .91 P .192	.3797 I .91 P .157	.7907 I .91 P .005	.0690 I .91 P .024	1.0000 I .91 P .0000	.4000 I .91 P .130
-.0516 I .91 P .440	-.0549 I .91 P .444	-.2055 I .91 P .020	-.1579 I .91 P .342	-.1004 I .91 P .321	-.1105 I .91 P .309	.1043 I .91 P .310	.6343 I .91 P .033	.4000 I .91 P .139	1.0000 I .91 P .0000
.3642 I .91 P .101	.3049 I .91 P .045	.6266 I .91 P .010	.5000 I .91 P .001	.0730 I .91 P .001	.0070 I .91 P .001	.3952 I .91 P .174	.1001 I .91 P .391	.1033 I .91 P .310	-.1714 I .91 P .330

(COEFFICIENT / CASES) / SIGNIFICANCE)

A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)

Table N (continued)

PEARSON CORRELATIONS FOR CLASS MEANS

FILE NO NAME (CREATION DATE = 04/02/80)

SUBFILE	CLA1	CLA2	CLA3	CLA4	CLA5	CLA6	CLA7	CLA8	CLA9	
PEARSON CORRELATION COEFFICIENTS										
	PROBSLV1	PROBSLV2	COMP1	COMP2	SPSTACH1	SPSTACH2	SUMATT11	SUMATT12	SUMATT21	SUMATT22
SPERCLR2	.4567 (.9) P=.100	.5975 (.9) P=.045	.4655 (.9) P=.103	.5518 (.9) P=.062	.5597 (.9) P=.062	.5865 (.9) P=.048	-.3501 (.9) P=.178	-.3373 (.9) P=.167	-.3081 (.9) P=.210	.0246 (.9) P=.475
OR3CLR	-.0920 (.9) P=.407	-.1889 (.9) P=.313	.2145 (.9) P=.290	.0960 (.9) P=.403	-.0527 (.9) P=.446	-.1004 (.9) P=.399	.2678 (.9) P=.243	-.0217 (.9) P=.478	.3502 (.9) P=.178	-.3721 (.9) P=.162
PCTENG	.2241 (.9) P=.201	.1728 (.9) P=.328	.4589 (.9) P=.107	.4022 (.9) P=.142	.0522 (.9) P=.447	-.0191 (.9) P=.481	-.1311 (.9) P=.368	-.4245 (.9) P=.127	-.2206 (.9) P=.284	-.6658 (.9) P=.025
VEPLNSCR	-.1715 (.9) P=.330	.0629 (.9) P=.436	.2120 (.9) P=.292	.0853 (.9) P=.414	.4403 (.9) P=.113	.5456 (.9) P=.064	-.0812 (.9) P=.418	-.2343 (.9) P=.272	.1784 (.9) P=.323	-.1562 (.9) P=.344
PNHPLSC	-.1129 (.9) P=.386	.1209 (.9) P=.378	.2752 (.9) P=.237	.1502 (.9) P=.350	.5713 (.9) P=.054	.6577 (.9) P=.027	.0856 (.9) P=.413	-.0536 (.9) P=.446	.3470 (.9) P=.180	-.0204 (.9) P=.479
APERCLR1	.2539 (.9) P=.255	.3942 (.9) P=.147	.6582 (.9) P=.027	.5174 (.9) P=.077	.6417 (.9) P=.031	.6399 (.9) P=.032	.2959 (.9) P=.220	.0147 (.9) P=.485	.0322 (.9) P=.467	-.3721 (.9) P=.162
NPERCLR2	.4618 (.9) P=.106	.5364 (.9) P=.068	.5718 (.9) P=.054	.6498 (.9) P=.029	.4501 (.9) P=.112	.4457 (.9) P=.115	-.4344 (.9) P=.121	-.5083 (.9) P=.081	-.4543 (.9) P=.110	-.2370 (.9) P=.278

(COEFFICIENT / (CASES) / SIGNIFICANCE)

(A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)

Table N (continued)

PEARSON CORRELATIONS FOR CLASS MEANS

FILE NO NAME (CREATION DATE = 04/02/80)
SUBFILE CL41 CL42 CL43 CL44 CL45 CL46 CL47 CL48 CL49

	PEARSON CORRELATION COEFFICIENTS							
	SPERCLR1	SPERCLR2	OSCLR	PCTEND	HEPLNSCH	PMPLSC	MPERCLR1	MPERCLR2
PROBSLV1	.3562 I .91 P=.101	.4567 I .91 P=.100	-.0920 I .91 P=.407	.2241 I .91 P=.201	-.1715 I .91 P=.330	-.1129 I .91 P=.306	.2539 I .91 P=.255	.4610 I .91 P=.106
PROBSLV2	.5442 I .91 P=.065	.5975 I .91 P=.045	-.1000 I .91 P=.313	.1720 I .91 P=.320	.0429 I .91 P=.436	.1209 I .91 P=.370	.3942 I .91 P=.147	.5364 I .91 P=.040
COMP1	.4264 I .91 P=.025	.4055 I .91 P=.103	.2145 I .91 P=.200	.4509 I .91 P=.107	.2120 I .91 P=.292	.2752 I .91 P=.237	.6502 I .91 P=.027	.5710 I .91 P=.054
COMP2	.5000 I .91 P=.001	.5510 I .91 P=.062	.0400 I .91 P=.403	.4022 I .91 P=.147	.0053 I .91 P=.414	.1592 I .91 P=.350	.5174 I .91 P=.077	.6490 I .91 P=.029
SPSTACH1	.0730 I .91 P=.001	.5507 I .91 P=.062	-.0427 I .91 P=.446	.0022 I .91 P=.447	.4403 I .91 P=.113	.5713 I .91 P=.054	.6417 I .91 P=.031	.4501 I .91 P=.112
SPSTACH2	.0070 I .91 P=.001	.5065 I .91 P=.040	-.1004 I .91 P=.399	-.0191 I .91 P=.401	.0454 I .91 P=.066	.6577 I .91 P=.027	.6399 I .91 P=.022	.4407 I .91 P=.115
SUMATT11	.3552 I .91 P=.174	-.3501 I .91 P=.170	.2470 I .91 P=.243	-.1311 I .91 P=.360	-.0012 I .91 P=.410	.0056 I .91 P=.413	.2959 I .91 P=.220	-.4344 I .91 P=.121
SUMATT12	.1001 I .91 P=.391	-.3373 I .91 P=.107	-.0217 I .91 P=.470	-.4045 I .91 P=.127	-.2343 I .91 P=.272	-.0536 I .91 P=.446	.0147 I .91 P=.405	-.0003 I .91 P=.901
SUMATT21	.1033 I .91 P=.310	-.3001 I .91 P=.210	.3502 I .91 P=.170	-.2706 I .91 P=.206	.1706 I .91 P=.373	.3470 I .91 P=.100	.0322 I .91 P=.467	-.4543 I .91 P=.110
SUMATT22	-.1714 I .91 P=.330	.0244 I .91 P=.475	-.3721 I .91 P=.102	-.6650 I .91 P=.025	-.1542 I .91 P=.346	-.0204 I .91 P=.479	-.3721 I .91 P=.162	-.2370 I .91 P=.270
SPERCLR1	1.0000 I .91 P=0.0000	.5000 I .91 P=.051	-.1750 I .91 P=.322	-.0753 I .91 P=.424	.4639 I .91 P=.106	.5430 I .91 P=.065	.0662 I .91 P=.901	.4000 I .91 P=.107

(COEFFICIENT / (CASES) / SIGNIFICANCE)

A VALUE OF 99.9999 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED

Table N (continued)

PEARSON CORRELATIONS FOR CLASS MEANS

FILE NONAME (CREATION DATE = 04/02/00)
 SUBFILE CLA1 CLA2 CLA3 CLA4 CLA5 CLA6 CLA7 CLA8 CLA9

----- PEARSON CORRELATION COEFFICIENTS -----								
	SPERCLR1	SPERCLR2	OBSCLR	PCTENO	HEPLNSCH	PRMPLSC	APERCLR1	APERCLR2
SPERCLR2	.5800 (.9) P=.051	1.0000 (.9) P=*****	-.6169 (.9) P=.038	-.1399 (.9) P=.360	.1344 (.9) P=.365	.1776 (.9) P=.324	.3480 (.9) P=.179	.8981 (.9) P=.001
OBSCLR	-.1790 (.9) P=.322	-.6169 (.9) P=.038	1.0000 (.9) P=*****	.6411 (.9) P=.031	.2728 (.9) P=.239	.2621 (.9) P=.248	.1525 (.9) P=.348	-.3175 (.9) P=.203
PCTENO	-.0753 (.9) P=.424	-.1399 (.9) P=.360	.6411 (.9) P=.031	1.0000 (.9) P=*****	.0640 (.9) P=.435	-.0061 (.9) P=.494	.2714 (.9) P=.240	.2511 (.9) P=.257
HEPLNSCH	.4639 (.9) P=.104	.1344 (.9) P=.365	.2728 (.9) P=.239	.0640 (.9) P=.435	1.0000 (.9) P=*****	.9677 (.9) P=.000	.4467 (.9) P=.114	.0609 (.9) P=.438
PRMPLSC	.3430 (.9) P=.065	.1776 (.9) P=.324	.2621 (.9) P=.248	-.0061 (.9) P=.494	.9677 (.9) P=.000	1.0000 (.9) P=*****	.4688 (.9) P=.102	.0777 (.9) P=.421
APERCLR1	.0662 (.9) P=.001	.3480 (.9) P=.179	.1425 (.9) P=.348	.2714 (.9) P=.240	.4467 (.9) P=.114	.4688 (.9) P=.102	1.0000 (.9) P=*****	.4121 (.9) P=.135
APERCLR2	.4588 (.9) P=.107	.8981 (.9) P=.001	-.3175 (.9) P=.203	.2511 (.9) P=.257	.0609 (.9) P=.438	.0777 (.9) P=.421	.4121 (.9) P=.135	1.0000 (.9) P=*****

(COEFFICIENT / (CASES) / SIGNIFICANCE)

(A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)

Center Planning and Policy Committee

Richard A. Rossmiller
Center Director

Dale D. Johnson
Area Chairperson
Studies in Language:
Reading and Communication

Marvin J. Fruth
Area Chairperson
Studies in Implementation
of Individualized Schooling

Penelope L. Peterson
Area Chairperson
Studies of Instructional Programming
for the Individual Student

James M. Lipham
Area Chairperson
Studies of Administration and
Organization for Instruction

Thomas A. Romberg
Area Chairperson
Studies in Mathematics and Evaluation
of Practices in Individualized Schooling

Associated Faculty

Vernon L. Allen
Professor
Psychology

B. Dean Bowles
Professor
Educational Administration

Thomas P. Carpenter
Associate Professor
Curriculum and Instruction

W. Patrick Dickson
Assistant Professor
Child and Family Studies

Lloyd E. Frohreich
Associate Professor
Educational Administration

Marvin J. Fruth
Professor
Educational Administration

Dale D. Johnson
Professor
Curriculum and Instruction

Herbert J. Klausmeier
V.A.C. Henmon Professor
Educational Psychology

Joel R. Levin
Professor
Educational Psychology

James M. Lipham
Professor
Educational Administration

Dominic W. Massaro
Professor
Psychology

Donald M. McIsaac
Professor
Educational Administration

Wayne Otto
Professor
Curriculum and Instruction

Penelope L. Peterson
Assistant Professor
Educational Psychology

Thomas S. Popkewitz
Professor
Curriculum and Instruction

Gary G. Price
Assistant Professor
Curriculum and Instruction

W. Charles Read
Professor
English and Linguistics

Thomas A. Romberg
Professor
Curriculum and Instruction

Richard A. Rossmiller
Professor
Educational Administration

Peter A. Schreiber
Associate Professor
English and Linguistics

B. Robert Tabachnick
Professor
Curriculum and Instruction

Gary G. Wehlage
Professor
Curriculum and Instruction

Louise Cherry Wilkinson
Associate Professor
Educational Psychology

Steven R. Yussen
Professor
Educational Psychology